China's Small Arms of the 2nd Sino-Japanese War (1937-1945)

2014

Bin Shih 史宗賓

Edited by Stanley Zielinski

China's Small Arms of the 2nd Sino-Japanese War (1937-1945)

Copyright © 2011-2014 by Bin Shih. The First print: 2011. The second print: 2014.

All rights reserved. No part of this book may be reproduced or transmitted
in any form or by any means without written permission from the author.

Printed in USA by 48HrBooks (www.48HrBooks.com)

This book is dedicated to all of those people who made sacrifices during the eight years of war against Japanese aggression in China. Millions of them made the ultimate sacrifice for the survival and freedom of China, Chinese or otherwise.

Introduction

There is considerable printed material in English on the Sino – Japanese War of 1937 – 1945, but very little of it is concerned with Chinese small arms of the period, especially detailed descriptions of the small arms made and used by the Chinese. A number of books have been written in English on Japanese small arms of the WWII period, but there is not a single book in English on Chinese small arms with the possible exception of Dolf Goldsmith's book Arming the Dragon.

Much of what is "known" about Chinese small arms is not based on reliable sources, so there are a number of misconceptions. And although there are a number of Chinese works on the subject, these are in Chinese and so of limited usefulness to most Westerners.

This book fills that gap. Based on credible Chinese sources and the actual arms themselves, this English version of the book serves as an accurate, reliable guide to Chinese small arms of the 1937 – 1945 period. I suggest that anyone interested in Chinese small arms of the WWII era, and indeed anyone interested in the Pacific theater of WWII, should buy this book.

Stanley Zielinski

Foreword

China had been at war with Japan since 1937, four years before Pearl Harbor, which made it an eight year struggle. Some historians even hold the belief that in fact the war started when Japan invaded Manchuria in 1931, which would make the war a fourteen year struggle. One way or the other, China suffered a great deal of loss in that war, millions of people perished and its economy ruined.

This book tries to depict a small portion of that war by examining the small arms in use during that period. Hopefully it can restore some sense of reality of that difficult time.

This was a companion book to the "Small Arms of Chinese Army during the War of Resistance" published by "Qing Bing Qi"(Small Arms) magazine in November, 2009, Beijing (in Simplified Chinese). The original Chinese edition (in traditional Chinese) was published in Taipei, Taiwan, in 2005.

English edition was first printed in 2011. In 2013, the Chinese edition was published again by Aviation Industry Press, Beijing under the name "The Classified Folder of War against Japan: The Small Arms of China and Japan" (抗戰機密檔：中日軍隊輕武器, in Simplified Chinese), and the English edition was also reprinted.

I translated the manuscript myself but special thanks go to Stanley Zielinski who helped to review, edit and correct my translation. However, any errors are still my responsibility and mine alone.

I translated this companion book based on my latest manuscript. There are additions, corrections and, on rare occasions, some omissions from the Chinese version. It is not a total page by page translation but the Chapter, Section, etc. divisions are the same. One should be able cross reference the Chinese book and this companion volume fairly easily.

The primary sources of the photos or collections used in this book:

A. National Archives, US, courtesy of Leland Ness.

B. US Army Ordnance Museum, courtesy of Leland Ness.

C. Lewis Curtis.

D. US Signal Corps, courtesy of Leland Ness.

E. US Signal Corps, US Army Military History Institute, courtesy of Leland Ness.

F. An organization in Taiwan which wishes to remain anonymous but whose help is very much appreciated.

G. Armed Forces Museum, Taipei, Taiwan.

Special thanks go to Leland Ness, Stanley Zielinski & Lewis Curtis. Lee spent a tremendous amount of time doing the research and data collection to make this publication possible.

Bin Shih 史宗賓
Email: firearms@cox.net
Website: http://www.chinesefirearms.com/

Latest Book Intro:
http://www.chinesefirearms.com/ad2.html

Notes:

1. Chapter 1 was originally omitted in the China's edition; I have put it back here for completeness. It is part of the new Chinese edition now.

2. Schnellfeuer pistols and Astra, Royal, Azul versions were incorporated in Chapter 3 with the semi-automatic version. I moved the discussion to Chapter 7 under its own section. It is in Chapter 7 now in the new Chinese edition.

3. This is not a small arms encyclopedia, although the wide variety of the small arms described in the following pages may give that false impression. This author tried to put emphasis on the lesser known items. There will only be brief discussions of the more well known arms described in other publications.

Table of Content

CHAPTER 1. OVERVIEW 1

SECTION 1. BEFORE THE WAR 2
I. China 2
II. Japan 6
III. Around the World 9
SECTION 2. ON THE EVE OF WAR 10

CHAPTER 2. THE CHINESE ORDNANCE INDUSTRY DURING THE WAR 16

SECTION 1. ORDNANCE INDUSTRY MANAGEMENT 16
SECTION 2. ESTABLISHMENT OF THE ORDNANCE ADMINISTRATION OFFICE 18
SECTION 3. ORDNANCE DESIGNATION 20
SECTION 4. WAR TIME PRODUCTION MANAGEMENT 23
SECTION 5. WARTIME ORDNANCE PRODUCTION OVERVIEW 26
I. Overview 26
II. The Arsenals under the Ordnance Office management 30
A. Sichuan Province 30
a. The 21st Arsenal 30
b. The 1st Arsenal 33
c. The 20th Arsenal 35
d. The 24th Arsenal 36
e. The 25th Arsenal 37
f. The 26th Arsenal 37
g. The 30th Arsenal 38
h. The 50st Arsenal Branch 39
B. Arsenals in Other Areas 40
a. The 11th Arsenal 40
b. The 40th Arsenal 42
c. The 41st Arsenal 43
d. The 51st/53rd Arsenal 43
e. The Central Arms Repair Depot – the 44th Arsenal 45
C. Other Arsenals 46
a. Zhejiang Iron Works (浙江鐵工廠) 46
b. Shenxi Arsenal 47
D. Repair Depots and Chinese Communist Guerilla Ordnance Facilities 48
E. Arsenals were Incomplete or Shutdown 49
a. The 2nd Guangdong Arsenal 49
b. The 10th Arsenal 49
c. The Shanghai Arsenal 50
d. Eastern Three-Provinces Arsenal (aka Mukden Arsenal) 51
e. Taku Dockyard 52

CHAPTER 3. PISTOLS 55

SECTION 1. PISTOLS USED IN THE MILITARY 55
SECTION 2. DOMESTICALLY PRODUCED PISTOLS 56
I. Mauser Pistols Produced by Gongxian , Hanyang, and Taku 56
II. Shanxi .45ACP Type 17 Box Cannon 65
III. Shanghai, Jinling Browning 1900 Pistols 68
IV. Ruby Clone by Hanyang 70
V. 32 S&W Long Revolver of the 44th Arsenal 71
SECTION 3. IMPORTED PISTOLS 73
I. FN 1910、1922/10 Pistol 73
II. FN & Inglis Browning Hi-Power Pistol 74

III. Canadian 9x19mm Cartridges 76
IV. Spanish Astra 1921 (M400) Pistol 77
V. German Mauser 1910, 1914, and 1934 Pistols 78
VI. US Colt 1903 Pistol 79
VII. US Colt 1917 Revolver 80
VIII. US 1911/1911A1 Pistol 81
IX. US Savage 1907/1917 82
SECTION 4. OTHER DOMESTICALLY PRODUCED PISTOLS 83
SECTION 5. CAPTURED JAPANESE PISTOLS 86
I. Japanese Nambu Pistol 86
SECTION 6. THE COMBAT EXPERIENCE AND COMMENTS 87

CHAPTER 4. RIFLES 90

SECTION 1. THE SMALL ARMS IN CHINESE INFANTRY DIVISIONS 90
I. The Chinese Army Battalion Organization 94
SECTION 2. DOMESTICALLY PRODUCED RIFLES 95
I. Shanxi produced Type 38 Rifles 95
II. Liao produced (遼造) Type 13 Rifles 97
III. The Gongxian, Shanghai, Guangdong, and Guangxi produced (Mauser 1907 Pattern) Type 1st Year and Type 4th Year Rifle 100
IV. The Hanyang, Shanghai, Kaifeng, Shenxi, 21st Arsenal Produced Type 88 Hanyang Rifles 102
V. Type 77 Rifle produced by Zhejing Iron Works 108
VI. Gongxian, Guangdong, the 21st and the 1st Arsenal Zhong Zheng Shi (Chiang Kai-Shek) Rifles 112
VII. Mauser Model 1896 Carbine 119
SECTION 3. IMPORTED RIFLES 120
I. German Mauser 1898 Rifle 120
II. German Mauser K98k Rifle 121
III. Czechoslovakia ZH-29 Semi-automatic Rifles 122
IV. Czechoslovakia Vz-98/22 Rifle 123
V. Czechoslovakia Vz-24 Rifle 124
VI. Italian 1891 Carcano Rifle 125
VII. Polish K-29/Wz-29 Rifle 126
SECTION 4. OTHER SOURCES 126
I. The Russian War Loan and Military Equipment Acquisition 126
A. Russian Mosin-Nagant 1891、1891/30 series Rifles 128
II. US Lend Lease Act 129
A. US M1917 Rifle 131
B. US 1903A3 Rifle 132
C. US Savage produced Lee-Enfield SMLE No. 4 Mk 1* Rifle 134
D. US 7.92x57mm Cartridge 136
III. SACO – Sino America Cooperative Organization 137
A. US M1 Carbine 139
IV. Canadian Mutual Aid Board 141
V. Imported 7.92 Ammunition 141
SECTION 5. CAPTURED ENEMY WEAPONS 141
SECTION 6. OTHER WEAPONS 142
A. Type Xiang Yin (向應式) Rifle 144
B. Type 81 Short Rifle 144
C. Small Bore Training Rifles 145
SECTION 7. COMBAT EXPERIENCES AND COMMENTS 146

CHAPTER 5. LIGHT MACHINE GUNS & AUTOMATIC RIFLES 150

SECTION 1. LIGHT MACHINE GUNS IN THE CHINESE ARMY 150
SECTION 2. THE DOMESTICALLY PRODUCED LIGHT MACHINE GUN 151
I. The Sichuan, Guangdong, Shenxi, Taku and Other Produced ZB-26s 151
II. Sichuan produced KE-7 (Neuhausen KE7) Light Machine Gun 157
III. Jinglin Produced 8mm Automatic Rifle 158
IV. Liao Produced Type 17 Light Machine Gun 159
SECTION 3. IMPORTED LIGHT MACHINE GUNS 160
I. Danish Madsen Light/Heavy Machine Gun 160
II. Canadian John Inglis Bren Light Machine Gun 164
III. Finnish Lahti M26 Light Machine Gun 167
IV. FN Mle 1930(FM 30) Automatic Rifle 168
V. French 1922 Hotchkiss Light Machine Gun 170
VI. Russian Degtyarev Pakhotnyi DP-27/DP-28 Light Machine Gun 171
VII. Russian Model 1925 Maxim-Tokarev Light Machine Gun 172
VIII. British Lewis Light Machine Gun 173
SECTION 4. COMBAT EXPERIENCES AND COMMENTS 174

CHAPTER 6. HEAVY MACHINE GUNS 176

SECTION 1. THE ORGANIZATION OF THE CHINESE ARMY HEAVY MACHINE GUN COMPANY 176
SECTION 2. DOMESTICALLY PRODUCED HEAVY MACHINE GUNS 176
I. Hanyang, Huayang, and Shanghai produced Type Triple-Tens Water Cooled Heavy Machine Gun 177
II. Fujian, Gongxian, Shandong (魯), Hunan, Taku, Jinling Produced Maxim Water Cooled Heavy Machine Gun & Type 24 Maxim Water Cooled Maxim Heavy Machine Gun 184
III. Sichuan, Guangdong Produced Schwartzlose Heavy Machine Gun 191
SECTION 3. IMPORTED HEAVY MACHINE GUNS 191
I. Czech Produced ZB-37 Heavy Machine Gun 191
II. Japanese Meiji Type 38 Air-cooled Heavy Machine Gun 193
III. Japanese Taisho Type 3 Air-cooled Heavy Machine Gun 194
IV. French Hotchkiss Mle. 14 Air-cooled Heavy Machine Gun 195
V. Russian M1910 Sokolov Maxim Water-cooled Heavy Machine Gun 196
SECTION 4. COMBAT EXPERIENCES AND COMMENTS 197

CHAPTER 7. OTHER WEAPONS 200

SECTION 1. THE SUBMACHINE GUN IN THE CHINESE ARMY 200
SECTION 2. DOMESTICALLY PRODUCED SUBMACHINE GUNS 200
I. Gongxian, Taku, Shanghai, Jinling, Guandong, and Hanyang Produced Bergmann Submachine Gun 200
II. Shanxi Produced .45ACP Thompson Submachine Gun 204
III. Hua Yang, Chi Shui (赤水) Produced 7.63 Mauser Automatic Pistols 209
SECTION 3. IMPORTED SUBMACHINE GUNS 212
I. UD M42 Submachine Guns 212
II. German/Chinese ERMA Submachine Gun 214
SECTION 4. COMBAT EXPERIENCES AND COMMENTS 214
SECTION 5. ANTI-TANK WEAPONS 215
I. Canadian Boys Anti-Tank Rifle 215
II. US AT M1 Rocket Launcher 218
SECTION 6. GRENADE LAUNCHERS AND GRENADE DISCHARGERS 219
I. Type 27 Grenade Discharger 220
II. Type 28 Grenade Launcher 223
III. Japanese Type 10 Grenade Discharger 227
SECTION 7. HAND GRENADES 228

I. Shangdong, Gongxian, Jinglin, Shanxi, Hemp-Tail, Russian Pattern and Italian Pattern Grenades 228
SECTION 8. BROAD SWORDS AND BAYONETS 233
I. Broad Swords 233
II. Bayonets 234
III. Dress Daggers 235
CHAPTER 8. JAPANESE SMALL ARMS 239
SECTION 1. INTRODUCTION TO JAPANESE ARMY ORGANIZATION 239
SECTION 2. CARTRIDGES 242
I. 6.5x50mmSR 242
II. 7.7x58mm 243
III. 8x22mm 243
SECTION 3. RIFLES 244
I. Type 30 Infantry Rifle 244
II. Type 38 Infantry Rifle 245
III. Type I Rifle 245
IV. Type 99 Short Rifle 246
V. Type 2 Rifle 248
VI. Type 38 Cavalry Rifle 248
VII. Type 44 Cavalry Rifle 249
SECTION 4. PISTOLS 250
I. Type 14 Pistols 250
II. Type 94 Pistol 250
SECTION 5. LIGHT MACHINE GUNS 250
I. Type 11 Light Machine Gun 250
II. Type 96/99 Light Machine Gun 251
SECTION 6. HEAVY MACHINE GUNS 252
I. Type 3 Heavy Machine Gun 252
II. Type 92 Heavy Machine Gun 253
SECTION 7. OTHER ORDNANCE 254
I. Type 100 Submachine Gun 254
II. Type 30 Bayonets 255
III. Type 91/97/99 Hand Grenade 256
IV. Type 10 Grenade Dischargers 257
V. Type 89 Heavy Grenade Discharger 257
Appendix I. Reference Books and Small Arms Resources 260
SECTION 1. CHINA'S SMALL ARMS EXHIBITION 260
SECTION 2. REFERENCES 260
Appendix II. Idioms & Terminologies 263
Appendix III. Ordnance Office Arsenals As Of April 23, 1941 271
Appendix IV. Ordnance Office List of Ordnance In Service, December, 1933 274
Appendix V. Japanese Military Data 279
Appendix VI. Chinese Ammunition Container Markings 288

Chapter 1. Overview

"China is a backward, agricultural based society still using medieval production techniques, its industrial development is far insufficient for a modern war fair."

The National Defense Planning Committee, China Status Investigation Report, General Staff of the Nationalist Government, before the Sino-Japanese war

Picture 1 Chiang Kai-Shek (蒋介石), from about the time of the Northern Expedition (北伐). He led the Nationalist troops to unify China. It was one of the very rare examples in Chinese history that a military power from the south had accomplished unification. The Nationalist Government set up the capital in Nanjing (南京) in 1927, marking the beginning of the "Golden Decade".

Section 1. Before the War

I. China

On April 18, 1927, the Nationalist Government (國民政府) officially set up its capital in Nanjing, which superficially ended the warlord period that had plagued China since the fall of the Qing Dynasty. In reality, the government only effectively exercise control over the few provinces around the Yangtze River valley. The Northeastern Provinces (東三省) didn't declare "Flag Switching" (易幟) until December 29, 1928. Sichuan Province (四川) didn't come under the control of Nanjing regime until the death of Liu Xiang (劉湘) right at the beginning of the war. Yunan was under General Long Yun's (龍雲) control throughout the war. In Guangdong province (廣東), there was Chen Ji Tang (陳濟棠), and in Guangxi province, there were Li Zongren (李宗仁) and Bai Chongxi (白崇禧) clique. In the north, there was Song Zheyuan (宋哲元) who led the 29th Route Army, which controlled Beijing and its adjacent regions. Yan Xishan (閻錫山) ruled the Shenxi province (山西) as an independent kingdom. "China, was a concept, not one country."

On the other hand, since the Nationalist Government was the recognized government of China, it had to shoulder all the defaults, foreign debts and domestic financial issues. The national debt was US$893 millions from all the previous loans, various war reparations, etc.[1] However, under such a difficult situation, the officials from all levels of the Nationalist Government undertook a nation building effort between 1927 and 1937. The result was so spectacular that this period is often referred to as the "Golden Decade". In Nanjing, there are still today well laid out streets with tall parasol trees lining both sides, a gift to the people of Nanjing left from the "Golden Decade".

On August 1, 1927, the Chinese Communist party revolted in Nanchang (南昌), starting the armed struggle against the Nationalist Government. The Communists It established several Soviet style bases in Jinggang San (井岡山), Ruijin (瑞金), and Jiangxi province (江西). Under the guiding principle: "Maintain internal security first and repel foreign invasion later", the Nationalist Government carried out five encircling military operations to subdue the Communists, and finally forced the Communists to retreat to the west of China, the so called "Long March" (二萬五千里長征). The surviving Communist forces arrived at Yenan (延安) in Shaanxi province (陝西) in October, 1936 and were so much weakened that they faced immediate collapse.

In March, 1929, the Guangxi clique (桂系) and the Nationalist government were in armed conflicts over the appointment of Lu Tiping (魯滌平) as governor of Hunan Province (湖

1. China's Nation-Building Effort, Arthur Young, p.112. 1971 Hoover Institution Press, Stanford University.

南省). The conflict resulted in the defeat of the Guangxi troops in June.

In April, 1930, Lee Zongren (李宗仁), Yan Xishan(閻錫山) and Feng Yuxiang (馮玉祥) came together to "Topple Chiang" in the so-called “Zhong Yuan Campaign” (中原大戰). The fundamental reason for the conflict was that the power sharing arrangements after the Northern Expedition were never resolved. This conflict lasted for 6 months and the military and civilian casualties totaled almost 300,000. The affected war zones in Henan (豫) and Shandong(魯) provinces saw severe destruction, many people were driven from these areas and created a flood of refugees.

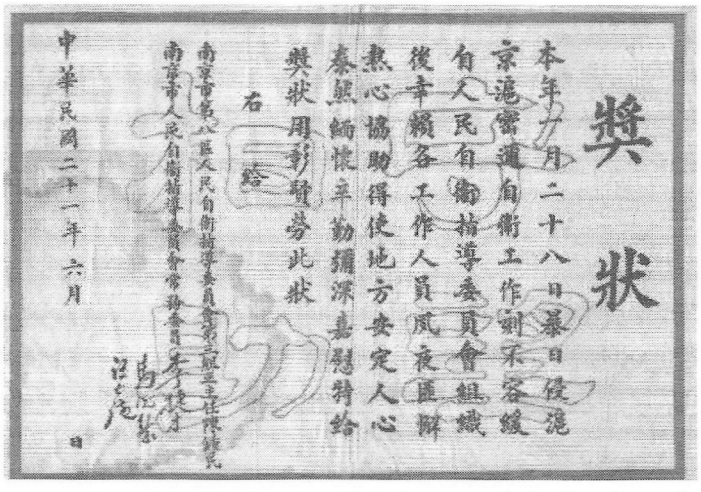
On September 18, 1931, the Japanese Kwantung Army (關東軍) mounted a large-scale attack on the Chinese military installation Bei Da Ying (北大營) in the city of Shenyang (瀋陽), using an excuse that the Chinese had blown up a section of the nearby Manchurian railroad. The Young Marshall (少帥), Zhang Xueliang (張學良) ordered his troops to be “prudent, avoid conflict". The Japanese expanded their invasion and eventually on February 5, 1932, seized the entire Three Northeastern Provinces (東三省). The Nationalist Government representative protested to the League of Nations and the League sent the Lytton Commission of Inquiry to investigate. The Commission’s report led to the withdrawal of Japan from the League of Nations on March 27, 1933.

With the mounting pressure from ideological disputes between the Nanjing, Shanghai and Guangdong factions of the Nationalist Party, Chiang Kai-Shek resigned all his posts in the government on December 15. Guangzhou's Nationalist faction took over the government.

On January 28, 1932, due to the increasing hostility between the Chinese and Japanese, several incidents occurred in Shanghai. The Japanese troops under the guidance of the Imperial Navy attacked the Chinese position in Zhabei (閘北), Shanghai. The Chinese garrison troops, the 19th Route Army, stood their ground.

The Nationalist Government also sent in its crack troops of the Fifth Army as reinforcements. The Japanese attacking forces increased the number of their troops and switched commanders several times but couldn’t gain any ground. The incident ended when the Chinese troops withdrew to the second line position. In May, China and Japan signed a truce to conclude the conflict. However, this incident had a profound impact on future events. The fighting spirit and skill of the Chinese troops won wide praise from domestic and foreign sources alike. The Chinese people now hated Imperial Japan even more. This led to the inevitable full scale conflict between China and Japan.

Picture 2 AA defense of the newly formed 5th Army with Oerlikon 20mm cannon. The reinforced 5th Army surpassed the 19th Route Army both in quantity and quality. However, the Nanjing Government never publicized their involvement which created the false impression that the 19th Route Army was the only Chinese force facing the Japanese aggression. Note the nice looking overcoat and the pull-down flap from the cap covering the ears. Source: A.



Picture 1 An award offered to the local self-defense unit in Nanjing after the conclusion of the Shanghai Incident. It provides an insight into the mobilization of public opinion by the Nanjing Government concerning the incident.

Picture 4 A commemorative coin purportedly issued to people who were involved in the Xian Incident, with Chiang's profile on one side and the inscription on the other: "We all have to rely on each other regardless of what the future brings, we'll all share the sweetness and bitterness together". The inscription was done by Dr. Sun Yat-Sen for revolution hero Huang Xin (黃興).

In 1936, the Mongolian leader Dewang (德王), instigated by Japanese support, invaded Suiyuan province (綏遠). The Nationalist troops under Fu Zuoyi (傅作義) immediately responded and decimated the invading troops at Bai Ling Miao (百靈廟). The Nationalist forces were ready to pursue and solve the problem once and for all, but then the "Xian Incident" (西安事變) occurred.

In the early morning of December 12, 1936. Zhang Xueliang and Yang Hucheng (楊虎城) dispatched troops to detain Chiang Kai-Shek who was visiting Xian. The incident was eventually resolved peacefully but Chiang was forced to enter the "Second Coalition" (第二次國共合作) with the Communists. There would be no more operation against the Communist bases and all forces should only be used against the Japanese aggression. This basically brought China to the brink of war with Japan without any other alternatives.

As a result of the Manchurian incident, the Japanese military's arrogance surged without check. On the other hand, the Chinese Nationalist government fully realized that it was not ready for a full scale conflict with Japan. After the Shanghai incident, the Nationalist government, even with its best

efforts to guide, suppress and convince public opinion, could barely contain the anti-Japanese sentiment throughout China.

II. Japan

American Naval Commander Matthew Calbraith Perry was ordered to command the East India squadron and charged with the delicate task of penetrating isolationist Japan. On July 8, 1853, he anchored his four ships, including the powerful steam frigates Mississippi and Susquehanna, in lower Tokyo Bay. This marked the opening of Japan from its isolation. Shocked by the advancement in the Western worlds, Japan started a series of rapid westernized efforts.

Domestically, the Meiji Emperor ascended the throne in 1868. The elimination of the Shogunate and the restoration of power to the Emperor marked the beginning of the "Meiji Restoration".

In April, 1871, the government announced the household registration law, in which the common people were allowed to have a surname. Later in February, 1875, it became compulsory that the common people must have a surname. In the same year in May, Japan formulated a new currency system.

In January, 1873, the National Conscription Order was passed. The nation was divided into 6 military management zones. This established the foundation for the nationalization of the army.

In August, 1875, the new educational system was established and this set forth the compulsory education system.

Picture 3 A wood print during war time. This form of art flourished during war time due to the lack of conventional printing and photography.

Abroad, Japan deposed the Ryukyu Islands (琉球) king in 1875 and absorbed the Ryukyu Islands into Okinawa county.

In 1885, Japan, taking the opportunity of the Korea "Coup D'etat," forced the Qing (清) government to sign the "Tianjin Conference Strip" (中日天津會議專條). In the agreement, both countries were given the same level of governing powers over Korea.

On February 11, 1889, the Meiji Emperor promulgated the Japanese Constitution.

In 1894, the Korean Tonghak Party (東學黨) rebelled and threw Korea into chaos. The Korean government requested assistance from the Qing government. Japan also sent troops and soon armed conflict between the Chinese and Japanese forces erupted. Chinese troops were defeated both on land and sea. China lost not only the governing power over Korea but also was forced to cede the island of Taiwan to Japan.

Japan also participated in the joint military operation during the 1900 "Boxer Rebellion." Its troops marched into Beijing among the other nations' soldiers.

In 1910, Japan abolished the Kingdom of Korea and made it into a colony.

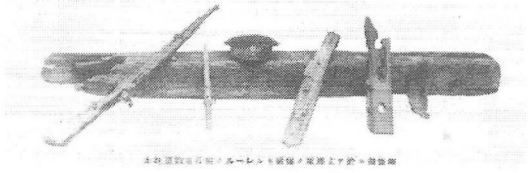
In 1911, Japan sent a special envoy to Russia to strike a secret agreement to set the area in China south of Changchun (長春) and Eastern Inner Mongolia (內蒙) as its sphere of influence.

In 1915, Japan declared war against Germany and dispatched troops to seize the German settlement in Jiao Zhou Wan (膠州灣), Shandong. In the same year, Japan proposed "the 21 Demands" (二十一條) to the then Chinese President Yuan Shikai (袁世凱), The contents were probably purposely leaked to the public and triggered wide spread protest, which became known as the famous "May 4th Movement" (五四運動) in China.

In 1925, A Japanese cotton mill factory owner in Shanghai maltreated the Chinese workers and even whipped one to death. During the negotiations with the worker delegates, the factory owner opened fire and killed another. This is known as the "May 30 Incident" (五卅慘案).

In May, 1928, the Northern Expedition troops captured Jinan (濟南). The Japanese forces intervened and massacred Chinese officials, delegates, and civilians. This is known as the "May 3 Incident" (五三慘案).

In 1931, the Kwangtung Army seized Manchuria.



Picture 4 The so-called evidence which started the September 18, 1931 Incident. The Kwangtung Army claimed that they captured a Vz-24 rifle, bayonet and uniform belonged to the Chinese Army at the location where the South Manchurian railroad track was demolished. This post card was issued by Yushkan, Tokyo, Japan (東京游就社).

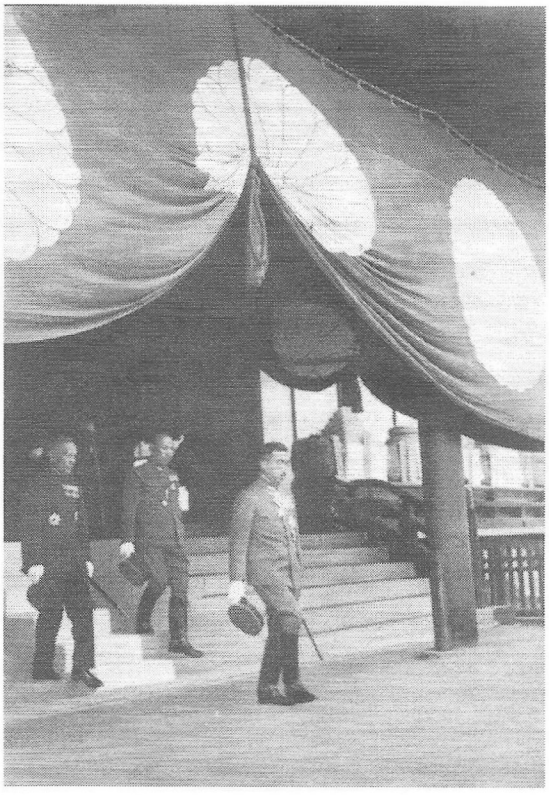
In 1932, the Japanese Navy triggered the "Shanghai Incident." Japan also formed the "Northeastern Administration Committee" in Shenyang. Eventually the Japanese turned this area into a supposed independent country called Manchukuo and installed the last Qing Emperor Pu-Yi (溥儀) as the Emperor.

In January, 1933, the Japanese forces attacked Shanhai Pass (山海關) at the Great Wall. In February, the Japanese attacked Jehol province (熱河) and various important passes

along the Great Wall. The Northwest Army (西北軍) fought bravely, especially at Xi Feng Kou (喜峰口), where it halted the Japanese advancement. At the end, the Nationalist Government was forced to sign the "Tangku Agreement" (塘沽協定). This agreement acknowledged eastern Hebei province (冀東) as a non-military zone.

In Japan in 1932, there was the "May 15 Coup", in which the prime minister Inukai Tsuyoshi was assassinated. In 1935, a Kodo-ha (Imperial Way Faction) army officer assassinated General Nagata. There were also several coup attempts which were either discovered by the police or never carried out. The "February 26 Revolt" in 1936 was one of the bloodiest, in which 21 officers, 94 NCO's and 1,358 soldiers from the 1st Division rampaged Tokyo for 3 days. Several Cabinet members were killed. The aftermath was dealt with in secrecy but the radical factions in the Japanese military became even more aggressive.

The Japanese military and their supporters believed that relying on foreign trade was the root cause of Japan's problems. Japan should establish a self-sustaining sphere which did not have to rely on any other economy outside of the Empire. The Great Depression provided them with the audience.



Picture 5 The Japanese emperor Hirohito in Yasukuni Jinjya. He let the military provoke the war and he himself magically escaped any postwar war criminal trial. World Pictorial, Issue 16, Japan.

In 1927, Japanese prime ministers Tanaka Giichi stated in a letter to the Emperor that: "Great Britain may obtain raw materials from India and Australia, US may obtain resources from Canada and South America. But in Japan, the supply of grain and raw materials is not even enough to support its population. If we only rely on trade, we will certainly to be defeated. ... ... We will have achieved nothing. ... The best strategy lies in taking positive measures to obtain special privilege in Manchuria and Mongolia. ... ..."

The strength of Japan's military power reached its peak prior to the War. There was no one to oppose them in Asia. Internationally it allied itself with Germany and Italy. Japan was ready to take some daring steps to satisfy its ambitions.

III. Around the World

In November, 1921, Secretary of State Charles E. Hughes, US, held the International Conference on Naval Limitation, with delegates from England, France, Japan, Italy, Portugal, Belgium, the Netherlands and China. One of the outcomes was the so-called Nine-Power Treaty. The Treaty endorsed the Open Door Policy for China and pledged mutual respect for Chinese territorial integrity and independence. In other areas, the Conference also reached agreements on the limitations of the tonnage of capital ships and accepted a moratorium on new naval construction.

The Nine-Power Treaty became the major forum for the Asia-Pacific disputes. When the Shanghai Incident occurred in 1937, China was still hoping that the major powers would intervene but they remained mute.

On October 29, 1929, the Wall Street stock market collapsed, and the economic crisis spanned across the globe. The Great Depression had tremendous impact on the world, there was only a little recovery at the end of 1933 and the output of most of the industrial countries was not restored to the 1929 level until 1935.

In the 1930s, the world was in turmoil. Treaties were signed between countries but were violated whenever they saw fit. The smaller and weaker countries looked up to the assistance of the League of Nations but the major powers thought the League of Nations was in the way and frequently threatened to withdraw, the collapse of the League of Nations became inevitable.

In response to the installation of Manchukuo, on January 7, 1932, the U.S. Secretary of State Henry L. Stimson announced the "Stimson Doctrine": the U.S. Government would not recognize any territorial or administrative changes the Japanese might impose upon China. At that time, the United States Congress and the Cabinet came under the great influence of isolationism, which opposed the US becoming involved in any international disputes.

Picture 6 Adolf Hitler greets the special delegate from Manchukuo. Germany eventually recognized Manchukuo and broke

the already weakened ties between China and Germany. World Pictorial, Issue 16, Japan.

In Germany, Hitler led the Nazi party in 1933 to control of Germany. Germany withdrew from the League of Nations in October, 1933. In March, 1935 Germany abolished the "Versailles Treaty" and started rearming. In October, Italy's Mussolini ordered his troops to invade Ethiopia. In 1936, Hitler also re-exerted German control over the Rhineland, sending troops into the area demilitarized since World War I. In the same year, Germany and Japan signed the Anti-Communist Pact, Italy also joined the pact a year later. On June 17, the Spanish troops stationed in Morocco revolted and full scale civil war erupted in Spain. Germany and Italy supported General Francisco Franco and sent volunteer troops to Spain. Russia and other countries were also secretly involved in that conflict.

At the end of 1937, a new global financial crisis was again looming in the horizon.

Section 2. On the Eve of War

"Once war breaks out, there is no difference between north and south in our land; there is no difference between young and old. Everyone has the duty to resist and protect our land; everyone needs to have the determination to sacrifice everything."

July 17, 1937, Chiang Kai-shek speech

After the conclusion of the Northern Expedition, China was still in turmoil. There was drought in Shaanxi province (陝西) and Gansu province (甘肅) in 1929, and some major floods in Shaanxi and Shenxi provinces in 1930, and Jiangsu (江蘇) and Anhui provinces (安徽) in 1931. The Yellow River crested in 1933, the Yellow River and Yangtze River flooded in 1935, followed by drought in Anhui and Sichuan province (四川) in 1937. These natural disasters created millions of victims and displaced people from their home land.

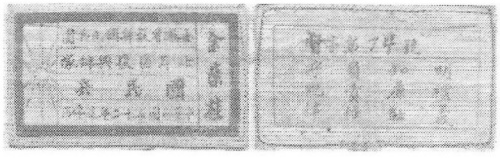
Even in the face of all these difficulties, the Nationalist Government continued its nation building efforts. It focused on the correct economic strategies, taking back control of the Customs, unifying the currency system, implemented compulsory education and established a common household census. The focus was to establish a modern structure from the ground up. It also managed to strengthen the national defense system and awareness of a need for national defense. Students were required to participate in basic military training in school and able citizens were to participate in the local militia groups forming everywhere.

On February 19, 1934, Chiang Kai-shek gave a speech titled: "The essentials of the New Life Movement" (新生活運動) in Nanchang (南昌). The speech opened the prologue for the New Life Movement. The four central principals of the new life movement were "Propriety, Righteousness, Integrity and a

Sense of Shame " (禮、義、廉、恥). This movement was to "reform the society, and revive a nation." The hope was to fundamentally change the people and adopt a set of modern national morals and knowledges. This was the first time among all the reform movements since the Opium War, that the core problem was touched on – there is not going to be a modern nation without modern citizens.

The Conscription law was implemented in 1936. The nation was divided into 12 Divisional Management Zones (師管區). It was first implemented in Henan, Hubei (鄂), Anhui, Jianxi (贛), Jiangsu (蘇) and Zhejiang province (浙). Other various provinces were already training civilians as militia (國民兵役). There were 50,000 young citizens drafted from July to December. The trained civilians amounted to 500,000 and the recruits in training numbered around 1 million.

Picture 7 Civilian military training completion certificate.

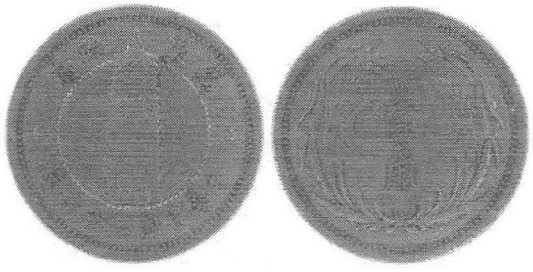


Picture 8 The breast tag of the same person while in training.

On January 26, 1935, the National Military Reorganization Conference was held in Nanjing. Its purpose was to reorganize the entire armed forces. On March 1, "The Army Reorganization Office (陸軍整理處)" was set up in Wuchang (武昌) in secrecy. The effort was headed by General Chen Cheng (陳誠). The army underwent several successive changes with the help of German advisors. The officers started staff field exercises and full scale troop exercises. In 1935, training camps were set up in Lu San (盧山). Here convened cadre personnel from the

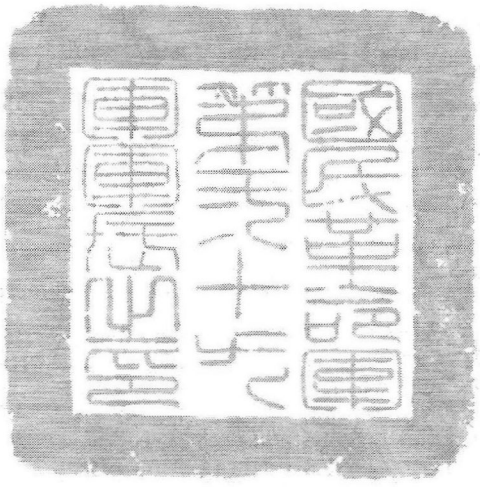
Nationalist Party, local officials, the Education Branch, the Police Force, the Military Training staff, the Political Training staff(政訓), the Boy Scouts and the New Life Movement for unified training. The officer training corps summoned all officers above the rank of Brigade Commander to raise the level of modern military knowledge and leadership skill.

Although the military power of Japan was still much more powerful than that of China, China had been making tremendous strides in modernization. The development would have surpassed Japan in ten years. The longer China could develop, the smaller the gap would become. Many people even thought that, China had a real good chance to defeat Japan if the war didn't erupt for another few years.



Picture 9 The coins issued by the Japanese supported puppet regime in Hebei. The regime collapsed because all its troops deserted after the Marco-Polo Incident.

Before the War, China ordered 12 submarines from Germany. Naval personnel were sent to Germany for training. Even though the naval forces of Japan were far superior to China's, the attempt to form a submarine fleet was viewed as an offensive gesture by Japan. In August 1937, TV Song (宋子文) told a special delegate from Japan: "The danger now is that the Japanese military underestimate the Chinese military and the Chinese military overestimate itself." This pretty much summed up the situation at that time.



Picture 10 The seal of the commander of the 29th Route Army.

On the night of July 7, 1937, Japanese troops near Wan Ping (宛平), Hebei province, claimed that there was a soldier missing. The Japanese insisted on entering the gated city to search, but the Chinese garrison troops refused. A fire fight broke out later in the night. In the following days, the Japanese acknowledged that the "missing soldier" had returned but still insisted on the Chinese troops apologize and withdraw from the current line. The negotiations broke down, and the conflict escalated into what is now known as the "the Marco Polo Bridge Incident" (蘆溝橋事變). The 29th Route Army

stood firm in its resistance and the Nationalist Government mobilized troops to move into the region in preparation to reinforce the 29th Route Army.

Picture 11 The Marco Polo Bridge, International News period photo.

It was clear at this point to the Nationalist Government that the Japanese were trying to nibble away China, the current target being Northern China. But the strong reaction from China also surprised the Japanese military. From this it can be seen that Japan only had the tactics but did not have the strategic view. By then the Japanese should have realized that:

1. North China was part of Zhong Yuan (中原) and was considered part of China proper. No regime could give up this area without a fight and still maintain people's support.
2. The alliance of the Nationalists and the Communists was aimed squarely at the Japanese aggression. There was a sense of unity in China among all factions.
3. The Chinese military was eager for action after its brilliant performance in the "Shanghai Incident".
4. With 10 years of nation building under its belt, China is no longer willing to take any humiliation from Japan.

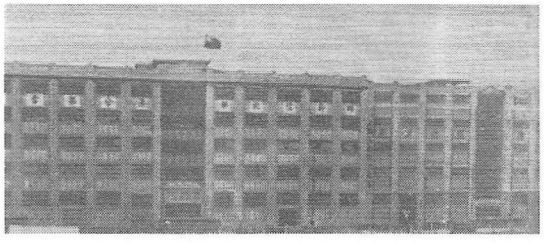
Picture 12 Soldiers from the 87th Division man their position in Shanghai during the 2nd Shanghai Incident.

Under these circumstances, the Nationalist Government made up its mind. To prevent a repeat of the historical sweep of the northern plain by the Mongolian cavalry that took the Song Kingdom in the south, the Nationalist Government decided to first attack Japanese interests in Shanghai to divert the Japanese line of attack and open the 2nd front line. Troops were mobilized from Nanjing, Guangdong, Guangxi, Sichuan, and Yunnan (滇) provinces and transported towards Shanghai. On August 13, 1937, the Nationalist troops launched an attack against Japanese positions in Shanghai, opening the second

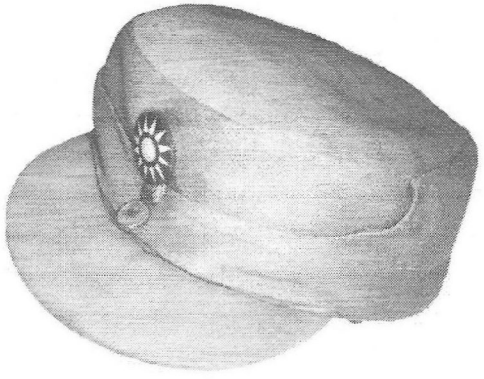
front. The 88th Division, 262nd Brigade, 523rd Regiment, and 1st Battalion (Yi Chin (易瑾) Battalion) made the first contact with Japanese forces in Zhabei. From this point on, China as a nation entered into the 8 years of bitter struggle against Japan, known as the "8 Years of War of Resistance (八年抗戰)."

『From this point forward, we have to unite as a nation, put forth all our mobilization plans, put in all the efforts of our race to achieve the final victory to sustain the survival of our nation and race.』

August 1, 1937, Chiang Kai-shek speech in the Central Military Academy



Picture 13 The Si Hung Warehouse (四行倉庫), the joined warehouse of four banks in Shanghai. The 88th Division left a battalion in these buildings and they fought the Japanese for another four days after the Chinese general ordered a retreat from Shanghai. The soldiers were hailed as the "800 Heroes." (They were only 400 strong but they claimed to be 800 to confuse the Japanese.) At the time it became a tremendous morale booster all over China.



Picture 16 The stamps to commemorate eight selected Military Heroes from all service branches who gave their lives in the War of Resistance. First issued in Taiwan, 1975.

Picture 15 Order of Propitious Clouds (雲麾) medal. This medal depicts a flag up in the clouds, symbolizing that the achievement of the receiver is worthy of such status.

Picture 14 Order of Precious Tripod (寶鼎) medal. A tripod shaped container was the treasured item passed down from generation to generation, symbolizing that the receiver is worthy of such treatment.

Chapter 2. The Chinese Ordnance Industry During the War

"What we are missing the most today isn't steel, isn't petroleum, isn't metal, isn't funding, isn't vehicle, isn't manpower; what we're missing is smart and efficient management."

Zhou Zixin (周自新), Superintendent of the 22nd Arsenal, Factual Report of the 22nd Arsenal Relocation to Yunnan during the War, The Relocated Factories & Business to the Southwest during the War

Section 1. Ordnance Industry Management

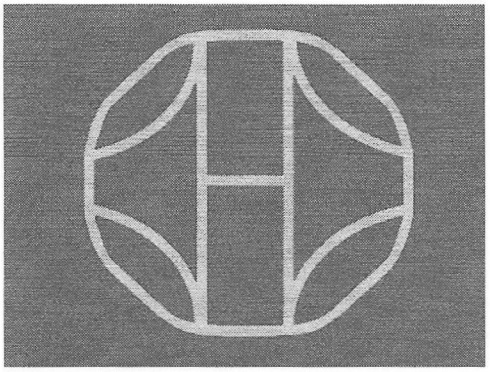
War is nothing new to China. Since ancient times war materials have been produced in large scale on a constant basis. There had been organized efforts from the central government to produce gunpowder and explosive devices since the Northern Song Dynasty (北宋) in the 10th Century. The various works employed upwards of 40,000 workers.

At the end of the Qing Dynasty, the original Manchurian Army known as "Ba Qi" (八旗), the Eight Banners, had already faded away as a capable military organization. This was replaced by the "Lu Ying" (綠營) which soon also decayed. The last resort was to raise troops from individual localities, called "Tuan Lian" (團練). These troops saved the Qing Dynasty from the Taiping Rebellion and other various uprisings. However, this put military power into the hands of provincial authorities. Western style arms making soon followed. There was no coordination between the various arsenals in terms of production capability, model and/or caliber. There was also no quality control or quality standards; product quality varied a great deal from arsenal to arsenal.

Even before the 1911 republican led revolution, there were discussions in the Qing Government to consolidate the arms production facilities into 5 big plants – North, South, West, East and Central. After the Republic of China was established, all arms production facilities came under the management of the Military Arms Branch (軍械司) of the Army Department – at least in theory. However, China soon slipped into de facto civil war. Various warlords established their own areas of control, maintained by military force. Some even started their own arsenals - notable examples being Shenxi and the Eastern Three Provinces. The Army Department's jurisdiction could only extend to a few arsenals such as Shanghai, Hanyang (漢陽), Tehxian (德縣), Gongxian (鞏縣). The charter of the Military Arms Branch included:

Picture 17 A Chinese painting believed to be from the Jin dynasty (金), 12th century. It depicts a hunting scene and one of figures is using a shoulder held firearm aiming at a bird in the tree. Courtesy of an anonymous Chinese collector.

1. Preparation of official firearms patterns, inspection standards and distribution.
2. Firearms control.
3. Accessories production and proofing.
4. Preparation, distribution and exchange of accessories pattern standards..
5. Fortification artillery.
6. Military communication, balloon, railway and aero machine distribution and exchange.
7. Materials and tools acquisition for fortified city defense and offense.
8. Review of ordnance production technical standards.



Picture 18 The proof mark on firearms produced under the Army Department administration. This was in use up to 1930's.

Section 2. Establishment of the Ordnance Administration Office

After the Nationalist Government (國民政府) established its capital in Nanjing, the Ministry of Military Affairs (軍政部) was inaugurated on November 21, 1928. Under the Ministry, the Ordnance Administration Office (兵工署) was established. Its mission was to manage ordnance science, ordnance production and arms related administration matters. Under the Office control were the following:

1. Saltpeter and sulfur production facilities.
2. Powder production facilities.
3. Ordnance schools.
4. Ordnance materials production facilities.
5. Arsenals.
6. Ordnance Material Procurement Committee.
7. Ordnance Research Committee.
8. Audit Section.
9. Inspection Section.
10. Design Section.
11. General Services Section.

There were several Chiefs after the inception - Zhang Chun 張群, Yang Weitseng 楊維曾, Chen I 陳儀 and finally ballistic expert Dr. Yu Dawei 俞大維 took office in 1933. He started to establish the ordnance standards, raise production output and increase the variety of products such as optical instrument, gas masks and so on. This greatly increased the readiness of China for the upcoming Sino-Japanese War. In 1934, he also established the Unified Arsenal Accounting system. Yu held the post the longest and was one of the most influential individuals of China's modern ordnance industry..

In 1933, the composition of the Office was changed to Headquarters, Resource Branch, Executive Branch and Technical Branch. In 1935, it was reorganized into Headquarters, Manufacturing Branch, Technical Branch and Military Ordnance Branch.
The Manufacturing Branch (製造司) was organized into four sections: General Affairs,

Accounting, Inspection, and Material Acceptance. It managed:

1. Organization of various arsenals, ordnance material storage and depots.
2. Personnel management of the various arsenals, the ordnance material storage and the depots.
3. Labor related matters.
4. Import permits, transportation and licenses of all ordnance materials.
5. Production fund distribution, budget creation, approval, audit and all other accounting related matters.
6. Production planning, assignment and cost validation.
7. Real estate, machinery and tool record keeping, acquisition and validation.
8. Issuance and collection of unified production tolerances, engineering drawings and other quality standards.
9. Raw material distribution, accounting, validation and storage management procedures.
10. Tool production and accounting, validation and management.
11. Waste and defective items validation and handling.
12. New arsenal preparation, supervision and guidelines.

The Technical Branch (技術司) was organized into three Offices and six Sections. The three Offices were Physics and Chemistry Research, Design, and Education. The six Sections were Ballistics, Infantry Equipment, Artillery (Fortress) Equipment, Transportation Equipment, Communication Equipment and Specialty Ordnance. Its charters included:

1. Standardization of firearms and munitions.
2. Design and improvement of firearms, munitions, and other military equipment.
3. Inspection, validation and research of firearms, munitions, military equipment, and ordnance materials.
4. Storage and safe keeping. Instruction, translation, and compilation of firearms and munitions manuals.
5. Training ordnance personnel and supervising visiting personnel and those studying abroad.
6. Evaluating inventions and improvements in firearms, munitions and military equipment.

The Ordnance Branch (軍械司) was organized into Proofing, Safe Keeping and General Accounting Sections. Its charter included:

1. Organization of armories.

2. Personnel employment and promotion in the armories.
3. Budget and accounting of the armories.
4. Ordnance & munitions accounting, safe keeping, replenishment, repair, investigation, statistics, inspection, proofing and transportation.
5. Armory construction.
6. Payment for ordnance, munitions and military equipment, loss compensation, captured equipment recording, consumption and damage accounting.
7. Training of ordnance personnel.
8. Disposal of obsolete firearms, munitions and military equipment.
9. Firearms control and civilian ownership.
10. Establishing naming conventions and terminology standardization. Compilation of regulations and history of firearms, munitions and military equipment.

Picture 19 Ordnance personel in the 1936 Snider Gun Trial. Note the difference in uniforms compared to regular Army personnel at the right. From the archives of the Combined Services Command.

Section 3. Ordnance Designation

China didn't really have a widely used standard designation for all of its ordnance. Also standardization and mass production wasn't a widely accepted concept in China. Ever since the Song dynasty, artillery pieces were given quasi military n names such as "General Wei Yuan" (威遠大將軍) (Powerful and Far-Reaching General).

During the latter part of the Qing dynasty, China started producing Western style ordnance of. Although ordnance people were aware of Western naming convention such as M1888, etc., they continued to use literal names for ordnance, such as "Kuaili" (快利) (Fast and Sharp) and "Huanin" (華寧)

(Peaceful China). Other designations were even more ambiguous, such as "Old Mauser" (老毛瑟) (for Mauser Model 1871 and Mauser Model 1871/84), "New Mauser" (新毛瑟) (for German M1888 and subsequent Mauser models), "Large Caliber Mauser" (大口徑毛瑟) (for Mauser Model 1871), "Small Caliber Mauser" (小口徑毛瑟) (for German M1888 and subsequent Mauser models), "7.9mm Breech Loading Repeater" (七厘米九後膛快槍) (for German M1888 and subsequent Mauser models), etc.

The word "type" had been in use since the Qing dynasty. The Western world commonly used the term "Model" to designate different ordnance but China had used the word equivalent to "type". The usage probably was influenced by modern Japanese ordnance designation. Japanese use "Kanji" (which literally means Han (漢字 -Chinese character) as part of their written system and hence the character in Japanese and Chinese are written the same.

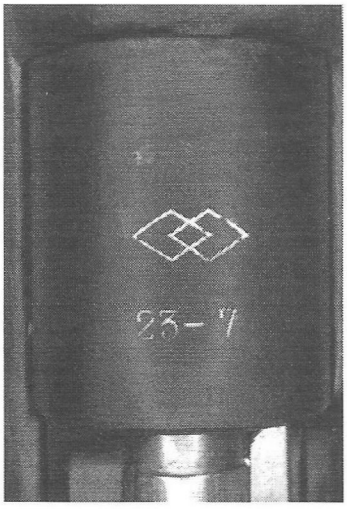
The first time that Chinese used a date as part of the designated type for its ordnance was after the founding of the Republic of China. "Type Year One" was the 6.8mm Mauser Model 1907 rifle China had adopted as the standard rifle for the new Republic. The Republic of China (ROC) was established in 1912 and so 1912 was designated as Year 1. (To calculate from the Republic year to the Gregorian calendar year: 1911+Republic year = Gregorian calendar year.)

Most of the arsenals started following that convention, such as the "Type 13" rifle produced by the Three Eastern Provinces Arsenal (東三省兵工廠), also known in the West as the Mukden Arsenal, and the "Type 13" 75mm Mountain Gun made at the Taiyuan Arsenal (太原兵工廠) (also known as the Shenxi Arsenal). There were still exceptions. For example, the "Type Ke" 75mm Mountain Gun made by the Shanghai Arsenal (上海兵工廠) (also known as the Jiangnan Arsenal). This was, in fact, a copy of a Krupp gun and so it retained the K as part of its name. The "Type Gong 98" rifle was made by Gongxian Arsenal (鞏縣兵工廠) and also retained Gong as part of its name. The "Type Triple -Tens" HMG (a copy of the Browning Model 1917 machine gun in 7.92 caliber) by Hanyang Arsenal (漢陽兵工廠) obtained its name from the fact that it was put into production on October 10, 1921 – which is three tens in the Chinese calendar – the 10th year (of the Republic), the 10th month and the 10th day.

Many official documents were still using vague names regarding ordnance such as "79 Rifle," "65 Rifle," "32 Pistol," etc. This poor terminology persists today. Often seen in the news media are phrases like "a "90 pistol" was found...", what was meant was

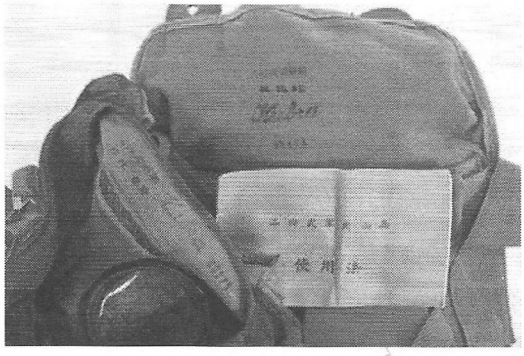
that a 9mm pistol was found but it says nothing about the model or make, etc.

Another uncommon practice was that the Chinese didn't put model designations on ordnance, especially small arms.



Picture 20 A "Type Gong 98" rifle receiver marking. Other than the arsenal mark and year and month manufactured, there is no model designation.

After the establishment of the Ordnance Office, the model designation was standardized. The year of adoption or significant modification made was taken as the model number. For example, the "Type 24" HMG was not first adopted in year 24 but significant standardization was introduced that year, hence it was called Type 24. Other items used the year that serial production started, such as the "Type 21" (廿一年式) rifle made by Guangdong Arsenal (廣東兵工廠), the "Type 27" Grenade Discharger (二七式擲彈筒), the "Type 31" 60mm Mortar (三一式六o迫擊砲), etc. However, there were still exceptions such as the "Zhong Zheng Shi" rifle (中正式步騎槍) (also known as the Chiang Kai-Shek rifle. Chiang Kai-Shek (蔣介石) was another name Chiang used. Pronounced in the Cantonese dialect, he was usually referred to as Chiang Zhong Zhen (蔣中正), which is the pronunciation in Mandarin). It was originally designated as "Type 24" Rifle but the name was changed to honor Chiang. There were also the "Zhong Zheng Shi" compass and 6x30 binocular.



Picture 21 A "Type 24" gas mask. Provided by LG.

There were other exceptions. The "Type 24" (二四式防毒面具） and "Type 27" (二七式防毒面具） gas mask were fine but then later a "Type Factory 42" (四十二廠式防毒面具） gas mask appeared. It certainly is confusing

The famous "Type Han 88" (漢八八式步槍) rifle produced by the Hanyang Arsenal (漢陽兵工廠) was one of the longest and

probably most numerous produced rifles in China. The 88 (for 1888) came from the original German designation; it had nothing to do with the arsenal which produced it nor the date serial production started in China. Based on the usual convention, it should have been called "Type Guangxu 21" rifle (光緒二十一年式) (1895). However, it never bore any model marking on the receiver until the manufacturing was turned over the 21st Arsenal, which put a "Type Han" (漢式) banner on the receiver ring. Again, that was not the convention. It could also have been called "Type 28" for that's the year serial production started in the 21st. Arsenal.

The most interesting designation was that of the mainstay LMG used throughout the war. This was the ZB-26, either imported or locally produced. It doesn't even have a Chinese designation; it was simply called the "Type Czech" (捷克式輕機槍) LMG.

There was a provincial arsenal in Zhejiang during war time called the Zhejiang Iron Works (浙江鐵工廠). All ordnance produced there were designated as "Type 77" 七七式 to commemorate the Marco Polo Bridge Incident.

Overall, one can see the chaos in the ordnance industry as reflected in the confusion of designations. One reason of course was the lack of unified administration due to communication and local warlord power play issues. Another reason was the privilege playoff rank. It was said that naming the rifle "Zhong Zheng Shi" was Dr. Yu's idea. He was the person in charge of the whole ordnance system so who could say no? Certainly they could name the rifle after Chiang but they should have given the rifle another official designation based on the convention to maintain the system.

A unified naming convention is not that difficult; it's the core of any modern manufacturing management. As evidenced by the quote from Zhou Zixin at the beginning of this chapter, China needed good management and managers to put things in order.

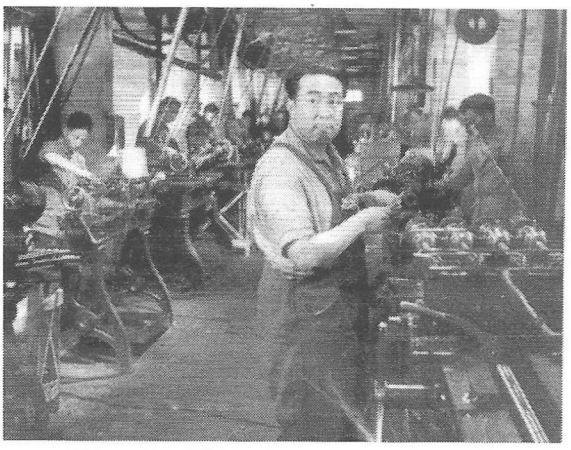
Section 4. War Time Production Management

In 1939, The Ordnance Research Committee and the Procurement Committee were established in addition to the Head Quarters Section and the Manufacturing, Technical and Ordnance Branches. Even though they were under the Executive Yuan (行政院) and, in theory, were civilian administrative branches, all personnel were commissioned military. The Office was run like any military unit, The various times of daily life were signaled by bugle calls, all

staff members wore uniforms and there was a Duty Officer (值星官) in charge.

In May, 1939, the Office put out an order stating that: "There was an order previously stated that all workers during the War of Resistance are considered military personnel (軍屬) due to their critical roles in ordnance production. This was done so that the personnel can be put under Martial Law based on the Defense Department temporary ruling number 7. However, these workers are skilled workers and their duties are as important as the soldiers in the front. They should not be drafted into the Army to cause any production interruption. All arsenals should put together personnel lists to be submitted to the Defense Department so they can be exempted from conscription."

In 1941, the Chungking (重慶) Militia Corps put out a notice that any able male who was not in military service should participate in militia training. The Military Affairs Department decreed that "All workers in the arsenals are already enlisted and should be treated as military personnel in service." [2]This further validated that ordnance workers were military personnel. Even the non-skilled workers were compensated according to the equivalent military pay grade.



Picture 22 Production workers in one of the arsenals during the war. Source: A.

In June, 1936, the Ordnance Office created "The Outlines for Ordnance Products Acceptance Procedure; Provisional" to unify ordnance products acceptance for all arsenals. The Technical Branch appointed inspectors to be stationed at each arsenal. The inspector was responsible for end product approval of the arsenal. Without the acceptance approval, no product could leave the arsenal. The inspector would apply his acceptance seal on the packing box or put a sealed slip over it. In the event of failure to pass inspection, the product would be returned to the arsenal to be refurbished or repaired.[3] This practice is also the reason that there is no acceptance or proof mark on the weapons themselves as in Western nations' practice.

Due to the tremendous demand for ordnance and munitions from the front line,

[2] Feb. 22, 1941, Ordnance Office order to waive arsenal personnel from militia training.

[3] Reference 4, p. 127

the supply of raw materials and resources often became problems. The "Wartime Production Bureau" (戰時生產局) was established at the end of 1944 at the suggestion of American advisors. The Bureau was to "achieve the maxim production capability for military and civilian alike". Its primary duties were to standardize military related raw materials and improve production efficiency, transportation, acquisition and distribution of ordnance production related raw materials. At the same time, the National Resources Commission (資源委員會) under the Economy Department also set priorities to supply all arsenals with their production needs.

The Ordnance Office Arsenals were organized on three levels – Arsenal, Department, and Manufacturing Facility (廠, 處,製造所三級制). According to the April 6, 1933 Organization Chart, each Arsenal consisted of Accounting Department, Benefit Office, General Office, Technical Department and Operation Department.

The Accounting Department had four sections: General Accounting, Compensation, Cost Calculation and Book Keeping.

The Benefit Office had Supply and Education sections with attached school, farm and hospital. It looked after the welfare of the personnel and their families.

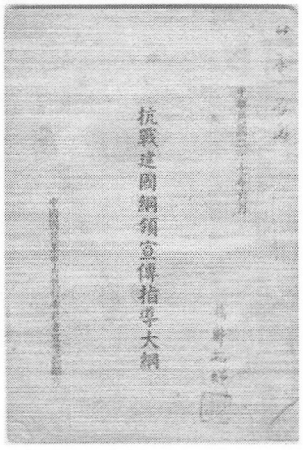
The General Office was in charge of Employment, Record Keeping, General Affairs, Procurement, Receivables & Payables, Construction, Transportation, Products, and Security.

The Technical Department had Design Office, Test Lab, Inspection, and Experiment Lab.

The Operations Department and Manufacturing Factories were the ones responsible for actual production. The Operations Department was responsible for production preparation, task distribution and material supply. It also owned the training facility to train qualified technicians. It was also responsible for the distribution of the technical drawings, raw materials supply, task distribution and employee training.

The Manufacturing Factories were under the Operations Department. It received the assigned tasks and organized resources to produce products. Based on the required components and skills, various factories were organized. The number of factories varies at each arsenal based on the products to be made.

To augment the meager pay to cope with wartime living, the arsenal provided actual daily necessities such as rice, oil and salt in addition to compensation,. The living quarters were also provided by the arsenal. There was also a bonus system to encourage productivity.



Picture 23 This propaganda pamphlet explained how to continue the nation building effort during the War.

Section 5. Wartime Ordnance Production Overview

"The War of Resistance was a great divide for the Ordnance Industry. Most of the raw materials were imported before the War. Now, most of the raw materials have to be domestically produced after the War broke out."

The Military Equipment Exhibition, Da Kong News (大公報), Chungking, March 18, 1942[4]

I. Overview

The 4th meeting of the 4th Nationalist Party Central Committee Conferences (國民黨四屆四中全會) passed the Tangible Materials Nation Building Policy (物質建設) on January 20, 1934. It decreed that: "The economic centers should not be threatened by foreign forces, secure the defense centers...all further construction of major factories, railway and telephone lines should follow the guide lines of the Military and Civil Defense Planning, reviewed and approved by the government. The major enterprises of national and civilian ownership alike should avoid the coast line. Various cooperatives should be set up to stimulate the production of agriculture products. The taxation system needs to be modified to encourage the development of commerce and tax evasion needs to be curtailed. Highway construction should focus on the west to obtain international entry points other then seaports."[5] It was here explicitly proposed that economic development would have to focus on future national defense needs in an international

[4] Reference 4, p. 262

[5] "The Guidelines for the Ongoing Tangible Nation Building Effort" (確立今後物質建設方針案), January 20, 1923, the 4th meeting of the 4th Nationalist Party Central Committee Conference.

war. The coast line couldn't be relied on and inland bases would be the key to a long term struggle.

When the war broke out, "the strategy of the first stage wartime industrial effort was to assist moving all factories and production facilities inland." On August 10, the 324th meeting of the Executive Yuan passed the decree to move the factories located in Shanghai.

The task of moving arsenals and supplies was organized by the Department of Military Affairs. After October, 1937, the Shanghai Steel Mill, the Telegraph Manufacturing and Repair Depot, the Transportation Machine Factory, the Artillery Factory in Zhuzhou (株州), the Military Uniforms Factory in Wuchuang (武昌) and the Wool Factory were all moved to the west.

One of the critical tasks during the move was the preservation of raw materials. Most of the critical materials at that time were imported. Without these materials, the ordnance production could not function. When Great Britain shut down the Burma Road, ordnance production dropped significantly. This problem was only resolved when domestic steel plants geared up to produce ordnance grade materials. Strictly speaking, the ordnance industries at the time were only processing imported raw materials into final products. Due to the lead time and high cost of the materials, products were expensive to produce and compounded with the low production output, it led to the continuous procurement of ordnance on the international market. On the other hand, the assertion of some experts that stated that Chinese ordnance used materials of dubious quality is completely untrue. These materials were the same as those used in the ordnance industries in Austria, Germany, etc.

In addition to utilizing quality material, the treatment of ordnance material followed very strict procedures. An excerpt from the 21st Arsenal stated:

- Carburizing: Utilizing solid carburizing (leather carbon). The temperature was raised to 850C to 880C, maintained for 3 hours and then cooled down slowly.
- 1st Quenching: This was to quench the non-carburized material inside the carburized component. The temperature was maintained at 900C for 5 minutes and then the material was rapidly cooled.
- 2nd Quenching: Quench the carburized component. Maintain a temperature of 760C to 780C for 5 minutes and quench in oil.
- Annealing: The annealing temperature is determined by the hardness

requirement of the material.[6]

All rifles & machine guns were required to pass a proof test before they could be accepted. It could be seen that the thorough hardening process of the existing samples of Zhong Zheng Shi rifles exceeded similar products from other nations.

Many researchers believed that German ordnance experts were responsible for the rapid progress of Chinese Ordnance Industries before the War. Some even went as far as to state that it was the Germans who created the modern ordnance industries in China. These statements are simply untrue. The primary interest of the Germans regarding the ordnance industry was commerce. None of the factories such as artillery factories, shell factories, automotive factories, central steel mill, etc., were completed before the war broke out. There was no significant impact on the war effort.

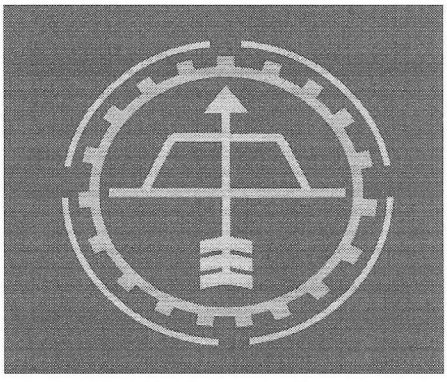
The primary problem for the Chinese ordnance industries was the lack of ability to produce the needed raw materials. There was no way to increase the output or efficiency without resolving this problem. There were little or no German technicians involved in the Chinese arsenals. The German advisors, some 80 of them, were busy training the Army troops. For the arsenals, there were indeed various advisors but they were from all over the world. One example was that of a naturalized Russian named Gregore R. Larikov (拉力果夫) working in the Aero Ordnances Research Institute (航空兵器研究所). He later invented the Type 28 grenade launcher which could be used on the Zhong Zheng Shi and Hanyang rifles.

When one reviews the prewar production figures, although production had increased year by year, it was an incremental increase. After the war broke out, the production figures sky rocketed. This should be enough evidence that no external assistance influenced the advancement of Chinese ordnance industries other than the war.

In the early days of the war, the Ordnance Office implemented another important change. It started the effort of re-organizing arsenals by product categories. Chinese arsenals had always tried to produce everything – from cartridges to cannon but were not good at any. This change would move cartridge production to a few arsenals and have them concentrate on it, small arms production would be the primary products of some others and so on. This was an important leap forward in production It allowed the management to focus on a few products and be good at making them. Some said later that it was a

[6] The 21st Arsenal Report: The Advisor Martin's Improvement Suggestions Regarding the Zhong Zheng Shi Rifle Production. May 14, 1936.

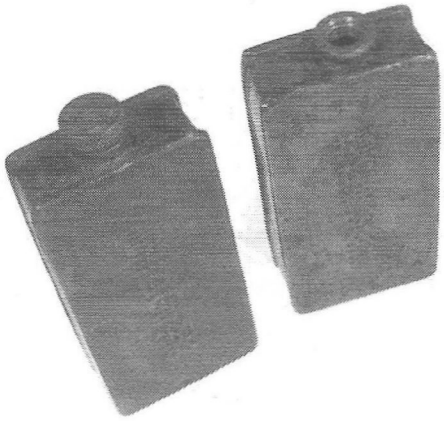
way for the government to control the arsenals because arms and munitions were now separated. These opinions were obviously biased and not consider the importance of production efficiency.



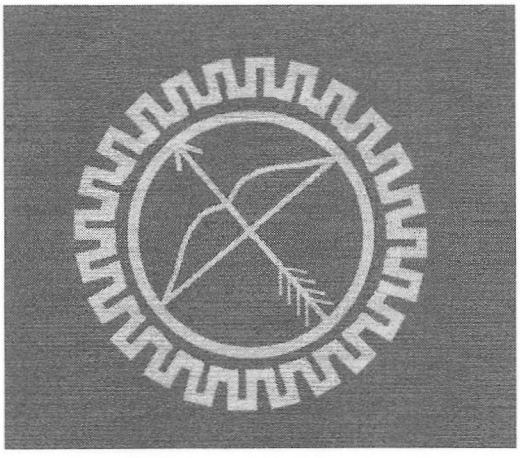
Picture 24 The Ordnance Office mark on some ordnance equipment produced in the early stage of the war.

As soon as the war broke out, most of the arsenals were forced to relocate westward inland. The primary location was around the Chungking area in Sichuan province. Some moved to Hunan but had to be moved again later due to the advance of the Japanese forces. The Guangdong Arsenal moved to Guangxi but had to move again later to Guizhou province (貴州). These moves were accomplished under constant enemy bombardment with little or no means of transportation. Thousands of tons of machinery, tools, and raw materials were transported by water, dirt road and sometimes carried by men. This was done through the willingness and sacrifice of the ordnance people, unseen in any other nation. It was an amazing feat that they achieved.

In February, 1938, the Ordnance Office ordered a name change of all arsenals. There were ten consecutive numbers assigned to each province and each arsenals located in that province would be assigned one number. The Hanyang Arsenal was the most famous so it got the number 1. All other arsenals in Hubei province would be numbered 2 thru 9. Hunan got the numbers 10 thru 19. Gongxian Arsenal had been relocated to Hunan at the time so it got the number 11. Arsenals in Sichuan were numbered from 20 to 29. The Sichuan Arsenal was assigned the number 20 and the relocated Jinlin Arsenal (金陵兵工廠) (from Nanjing) was in Chungking at the time and was assigned with the number 21. Shenxi was assigned the numbers 30 thru 39 and Guangxi was assigned 40 thru 49. The Guandong Arsenal was in Guangxi at the time so it got the number after the number of the Guanxi Arsenal – number 41. From this point on, all arsenals in China use numbers as names even today on both Taiwan and the mainland.



Picture 25 Gun oil bottled issued by the Military Affair Administration Office. Left: Made by Military Affair Administration Office. Right: 1/10 of liter of gun oil.



Picture 26 The Ordnance Office mark on ordnance equipment starting around 1942-1943.

II. The Arsenals under the Ordnance Office management

A. Sichuan Province

"The construction of the buildings and machinery setup were under way in parallel, Not wasting any time, the machinery was put back together as soon as it arrived. All people worked day and night to achieve their efforts..."

Lee Chuan Kan(李承幹), Superintendent of the 21st Arsenal, Managing an Arsenal during the War

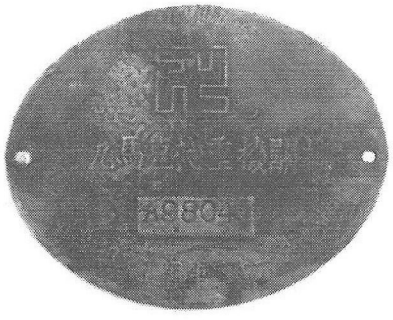
a. The 21st Arsenal

The Jingling Arsenal was first set up in 1865 by Viceroy Li Hong Zhang (李鴻章) after the last resistance of the Taiping Rebellion (太平天國) was put down at Nanjing (also known as Nanking). The original mission was to provide ordnance to Li's Hui Army(淮軍). Dr. Halliday Macartney was appointed as the first superintendent.

There were about 4,000 workers in the arsenal when the Sino-Japanese war broke out in 1937. The Japanese bombed Nanjing frequently in the early phases and the arsenal suffered some damages.

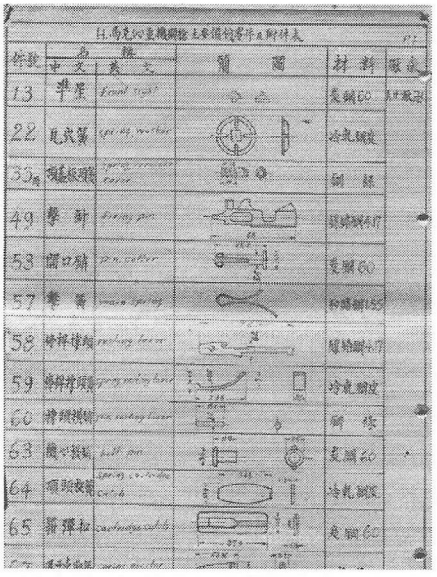
The Cartridge Factory was the first to be ordered to move to Chungking in September and merged into the 1st Arsenal of Sichuan (四川第一兵工廠). The order came again on November 15 to move everything else westward inland. In the following two weeks, almost 5,000 tons of machinery and materials were evacuated by trains, cars, boats and sampans, basically

whatever transportation they could get. The route taken was first to Hankow (漢口) and then moved on to Chungking. All personnel from superintendent on down were also evacuated. The last boat left Nanjing on December 6.



Picture 27 The serial number plate of a Type 24 Maxim machinegun with the arsenal mark of the 21st Arsenal 卍 - known as the "reversed swastika." It was not a swastika at all but a traditional Buddhist symbol for peace.

The relocated Jingling arrived in Chungking and started production immediately on March 1, 1938 at a location called Bojinshi (簸箕石). The arsenal name was changed to the 21st Arsenal. The first batch of 20 Type 24 HMG were produced out of the components brought from Nanjing.



Picture 28 The Type 24 Maxim parts list. Source A.

In July, the relocated rifle factory from the Hanyang Arsenal was transferred to the 21st Arsenal. Production resumed on Jan, 1939. The receiver marking was changed to a banner with "Type Han" (漢式) inside.

Also, on Jan 14, 1939, the 21st Arsenal took over the light machine gun factory from the 20thArsenal. In April, it took over the Chungking Arms Depot (重慶武器修理所), which had been originally set up by the local warlord. The factory had been producing KE7 pattern and ZB 26 pattern light machine guns. This marked the beginning of ZB-26 pattern light machine guns production in the 21st Arsenal.

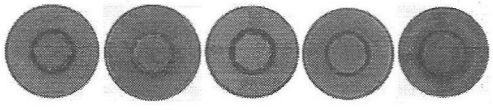
At this time, the Ordnance Office was consolidating all production facilities to

increase efficiency. There were several groups of arsenals –

- Artillery central: 51st,
- Ammunition central: 20th,
- Arms central: 21st, 11th, 41st, 1st, etc.
- Steel and Alloys: 24th, 28th, etc.

Machinery was moved accordingly and appropriate adjustments were made.

In March of 1939, the new 82mm mortar factory machinery arrived from Germany. A mortar factory was set up in Anning (安寧), Yunnan, as the Anning Branch of the 21st Arsenal. The production of mortar shells started in November, 1940, at the Anning Branch.



Picture 29 Headstamps of some of the 7.92x57 cartridges produced in the 21st Arsenal. Note that the direction of the 卍 is different from later versions, the "correct" version appeared around 1939. Woodin Laboratory (收藏).

In August, 1940, the 21st Arsenal received orders to change production to the Zhong Zheng Shi rifle. Strangely enough, the 21st Arsenal didn't obtain blueprints from the other arsenals but drew up their own. This was probably due to the fact that neither the 1st Arsenal nor the 41st Arsenal had a full set of blueprints. Preparation t started for retooling and pattern drawing. Over 8000 drawings were made using the German and Chinese made Mauser rifles as patterns. The Han rifle production was continued at the same time. The Zhong Zheng Shi rifle of the 21st Arsenal finally entered production in October, 1943. Han rifle production ceased in 1944. The barrels used for the Zhong Zheng Shi rifles were produced locally by the 24th Arsenal.

In March, 1941, the LMG factory, mortar factory and the tool factory were all relocated to Tongluoyi (銅鑼驛), inside a cave to avoid Japanese air raids.

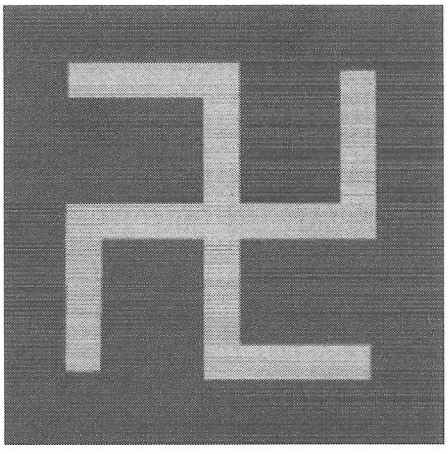
A heavy mortar factory was set up in October, 1943.

The 21st Arsenal was under good

War Time Small Arms Production Figures of the 21st Arsenal, 1937-1945									
Product/Year	**1937**	**1938**	**1939**	**1940**	**1941**	**1942**	**1943**	**1944**	**1945**
Type 24 Maxim	626	1,060	1,971	2,468	1,860	1,980	2,680	2,986	3,063
Czech Type ZB-26 LMG			892	900	150	930	2,041	2,020	2,900
Hanyang Rifle			41,500	53,814	31,500	46,600	33,400	350	
Zhong Zheng Shi Rifle								24,500	62,000

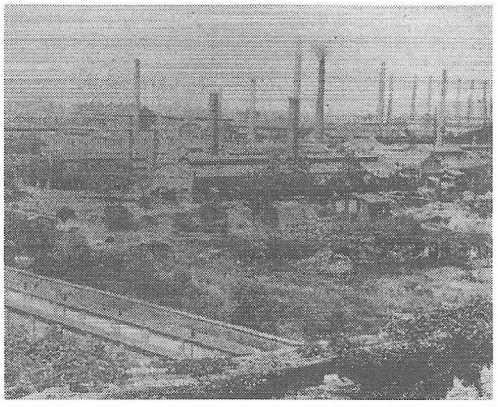
management and was relocated only once. It continued to expand during the war with an ever increasing production capacity. It became the most important ordnance production facility during and after the war.

Picture 30 Type 24's coming off the production line, waiting to partake in their share of the war. The AA configuration can be seen on the right. Source A.



Picture 31 The Arsenal mark of the 21st Arsenal.

b. The 1st Arsenal

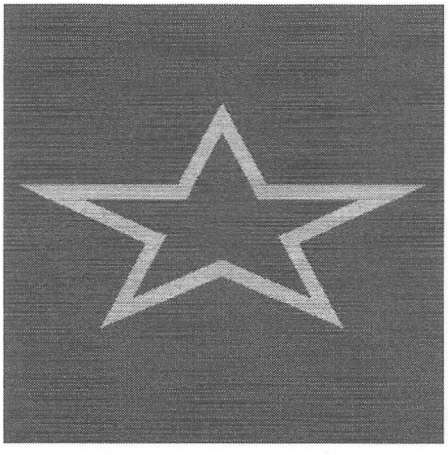


Picture 32 Full view of the Hanyang Arsenal. From the 70th Anniversary Special of the Army Ordnance School, September, 1987, Taipei.

The relocated Hanyang Arsenal was renamed the 1st Arsenal . It was originally located at the base of Kwei Mountain (龜山) at Hanyang (漢陽) in Hubei Province. It was first established in 1894 by Viceroy Zhang Zhi Dong (湖廣總督張之洞). The original idea was to create a full function arsenal to produce rifles, pistols, artillery and associated ammunition. A separate factory was set up nearby to produce gun powder and steel. The Hanyang rifles produced there were the most famous and were the longest remaining in production of the same type in modern Chinese ordnance history.

Picture 33 Hanyang once issued stock to raise funds. This is a 10 Yuan certificate.

In February, 1938. Hanyang was renamed the the 1st Arsenal. Due to the invading Japanese forces approaching Wuhan (武漢), the 1st Arsenal was relocated to Chen Xi (辰谿), Hunan (湖南). The Artillery Factory was transferred to Artillery Technical Research Institute, It later became the Zhong Shu (忠恕) branch of the 50th Arsenal.



Picture 34 The Arsenal mark of the 1st Arsenal.

In March, 1939, Hanyang resumed the production of cartridges in Chen Xi, Hunan province. The machine gun section, welding shop and machine shop also resumed production in July. Shortly thereafter Hanyang was ordered to move to Chungking. A location was found at Er Gong Yan (鵝公岩) for the new production site. The construction dug out a cave in the mountain to house the operation.

Due to the difficulties encountered in the moving process, Hanyang merged its operations with the 11th Arsenal. The cartridge factory, the machine gun factory and the power plant were transferred to the 11thArsenal, At the same time, part of the 11th Arsenal was already in Chunking, so the rifle factory and artillery shell factory were transferred to the 1stArsenal. This movement of facilities has generated a great deal of confusion among the collectors of Zhong Zheng Shi rifles.

The Zhong Zheng Shi rifle production resumed on the 1st of July, 1932. The monthly output was 4,000 rifles.

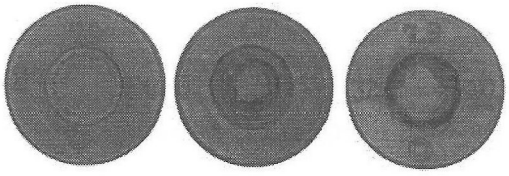
The 1st Arsenal went through some problems with relocation, adjustment and changes. It became a less important ordnance facility during the war and was disbanded after the war.

Picture 35 The attached Ordnance School of the 1st was the longest running ordnance educational institute in Chinese ordnance history. This is a graduation diploma of its elementary school unit.

c. The 20th Arsenal

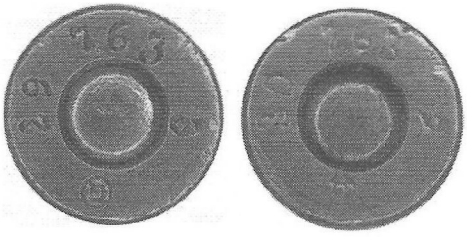
The 20th Arsenal was the Munitions Plant of the Sichuan & Xikang Pacification Office (川康綏靖主任公署), located at Tungyuan Chu (銅元局), in southern Chungking. It was controlled by Liu Xiang (劉湘). The Ordnance Office took over the plant in August, 1937, and renamed it the 1st Arsenal of Sichuan. It was later renamed as the 20th Arsenal in March, 1938.

The 20th Arsenal was the primary ammunition producer during the war. It produced cartridges for rifles, machineguns and pistols. The 7.92 spitzer and round nose cartridges were the primary products. Annual output started at 7.9 million rounds. At the end of the war, the monthly output was 10.8 million rounds.



Picture 36 Headstamps of 7.92x57 rifle cartridges produced by the 20th Arsenal. Woodin Laboratory collection.

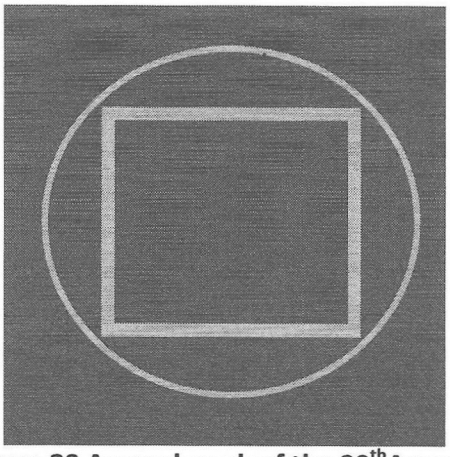
Production figures of the 20th Arsenal									
	1937	1938	1939	1940	1941	1942	1943	1944	1945
7.9 Spitzer/round nose cartridge	7,915,000	101,345,600	72,000,000	51,729,500	54,268,000	75,134,500	65,050,000	70,193,130	64,558,810
7.62 Rifle/machine gun cartridge (Russian type)			425,000	183,500	250,000		69,600	44,800	
7.63 Pistol cartridge				1,000,000	3,039,550	3,052,500	2,107,500	720,800	500
Percentage of total machine gun cartridge production	39.30%	43.10%	32.10%	38.90%	24.70%	37.90%	45.50%	52.90%	35.70%



Picture 37 Headstamps of 7.63x25 pistol cartridges produced by the 20th Arsenal. Woodin Laboratory collection.

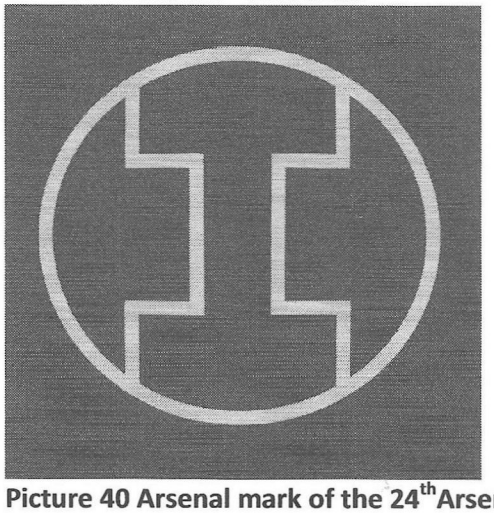
In 1938, it expanded south and obtained another 1,849 acres of land for the new facilities. The #4 land mine was added into the production list. At the end of the War, it could produce 16,000 landmines monthly.

Picture 38 The personnel identification badge for the Repair Depot of the Sichuan & Xikang Pacification Office.



Picture 39 Arsenal mark of the 20th Arsenal.

d. The 24th Arsenal



Picture 40 Arsenal mark of the 24th Arsenal.

The 24th Arsenal was the renamed Chungking Electric Steel Mill (重慶電力煉鋼廠), originally established in 1909. In the early years, The plant functioned sporadically.. In 1929, Yang Jihui (楊吉輝) convinced Liu Xian to consolidate steel refinery capabilities to boast the local industrialization in Sichuan, and at the same time resolving the raw material supply problem for weapons production. Liu appointed Yang as the chairperson to form a committee to consolidate the existing facilities and buildings into a new one.

At the beginning of 1937, the steel refinery was taken over by the Ordnance Office. On

January 8, it produced 4 tons of carbon tool steel.

It was renamed the 24th Arsenal on January 1, 1939, and Yang continued as head. The facility also expanded significantly. It added a 1,000 ton water reservoir, a 2,000kw generator, a 3 ton Morgan furnace, a silicon iron furnace, a 2 ton steam operated hammer, a rolling mill, a steam operated cutter, a saw machine and a 150 ton friction press.

The iron ore came from local mines in Sichuan. However, some of the materials needed for steel production were no longer available from abroad. The arsenal devoted its resources to producing such items as electrodes and silicon shields. The 24th Arsenal was one the largest steel producers during the war; it produced 4,000 tons of steel and 3,900 tons of other steel products such as nails and screws annually.[7]

The tungsten alloy barrels used by the 21st Arsenal Zhong Zheng Shi rifles were provided exclusively by the 24th Arsenal. It also took over the production of the Type 28 grenade launcher, of which it could produce 1,000 units per month at the end of the war.[8]

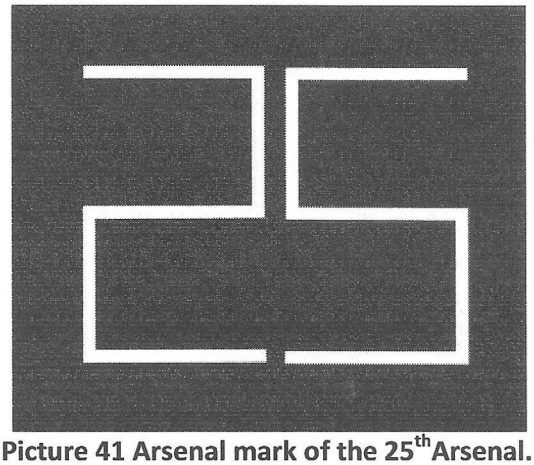
e. The 25th Arsenal

This Arsenal started out as the Munitions Plant of the Artillery Technical Institute (炮兵技術研究處) in Hunan. It relocated to Chungking in 1938 and became the 25th Arsenal in 1939.

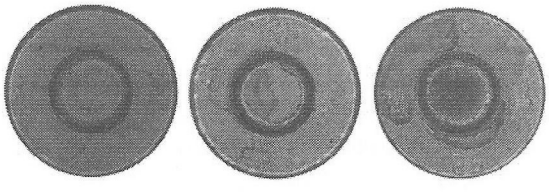
The main products were cartridges and hand grenades. Along with the 20th Arsenal, it was one of the two main cartridge producers during the war.

In 1945 its monthly output was 5.5 million cartridges and 60 thousand hand grenades.

Some production figures of the 25th			
	1939	1940	1941
7.9 Spitzer cartridges	10,200,000	19,000,000	20,500,000
7.9Round nose cartridges	5,000,000	14,100,000	13,000,000
7.9 Machine gun cartridges		1,000,000	
Hand grenades	81,000	185,000	359,000
11mm (.45 ACP) Submachine gun cartridges			150,000



Picture 41 Arsenal mark of the 25th Arsenal.



Picture 42 Headstamps of 7.92 cartridges produced in the 25th Arsenal, Woodin Laboratory Collection.

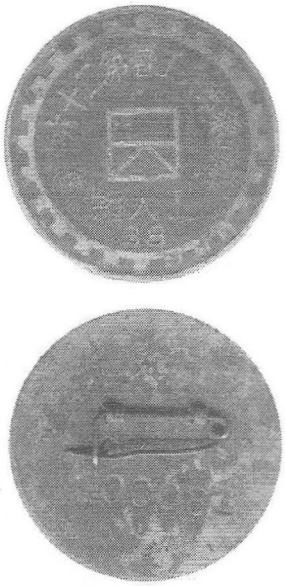
f. The 26th Arsenal

When the war broke out, there was an urgent need for large amounts of high explosives. To produce explosives with domestically available materials, Ordnance

[7] Reference 4.
[8] Reference 4, p. 60.

Office Technical Manager (技正) Zhou Zhong Yang (周宗樣) was assigned the task of planning for a production facility.

The product chosen was potash chlorates based explosives based on ease of manufacturing and material availability. Then plans were made to establish a manufacturing facility.



Picture 43 Personnel badge for the 26th Arsenal.

One of the components needed was potash (桐鹼) made from the fruit of the Tung tree. By orders of the Ordnance Office, the arsenal started working with the Sichuan Tung Oil Trading Co. to gather quantities of potash. The location of the facility was selected in 1939 and the Preparatory Office was moved to Zhang Shou 長壽 in February, 1940.

The facility construction was under way and the procurement was signed to obtain the production machinery from the US.

Production started in January, 1945. 30 tons of potash chlorates were produced in March and May, 10 tons were produced in July, and 20 tons were produced in all other months. The final test of the explosive held in June gave satisfactory results.

Before the mass production of explosives commenced, the war had ended.

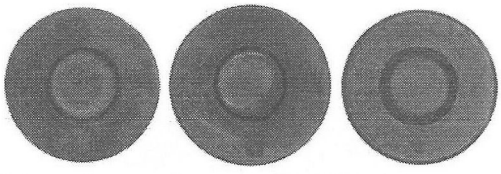
g. The 30th Arsenal

This arsenal was originally the Jinan Arsenal (濟南兵工廠) in Shandong (山東). It relocated to Xian (西安) and changed its name to the 1st Arsenal of Shaanxi (陝西第一兵工廠). It produced a variety of products but only in small quantities. It was relocated to Chungking in 1938 and was assigned the task of producing small munitions and launchers.

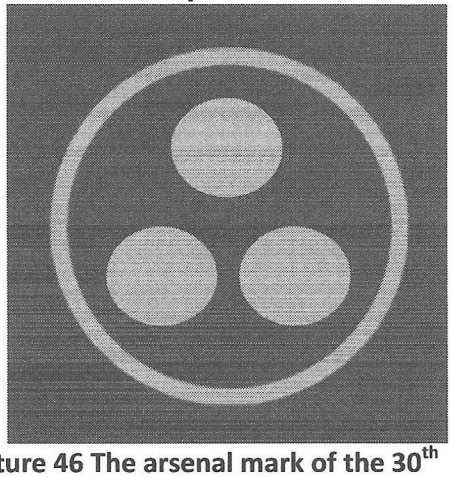
It received the task of producing a grenade discharger in 1938. The final product was adopted as the Type 27 grenade discharger. The discharger design was a simplification and improvement of a Japanese pattern. The discharger and the grenade became the primary product of the 30th Arsenal.

Picture 44 The personnel badge for the 30th Arsenal.

Production figures of the 30th Arsenal								
	1938	1939	1940	1941	1942	1943	1944	1945
Hand grenades	169,100	1,534,887	606,144	1,086,421	963,690	750,000	630,000	783,000
Type 27 grenades		82,795	163,558	252,190	222,770	227,000	308,000	294,000
Type 27 grenade dischargers		10,300	7,702	5,709	9,148	6,000	50	2,000



Picture 45 Headstamps of 7.92x57 cartridges produced by the 30th Arsenal. Woodin Laboratory Collection.



Picture 46 The arsenal mark of the 30th Arsenal.

Picture 47 Personnel badge of the Sichuan Arsenal.

h. The 50st Arsenal Branch

The Shandong governor Ding Baozhen (丁寶楨) was appointed as the Sichuan Viceroy in 1876. He requested bringing the Shandong Machinery Bureau (山東機器局) and Superintendent Xu Jianyin (徐建寅) along to establish a Machinery Bureau in Sichuan. This was the beginning of arms production in Sichuan.

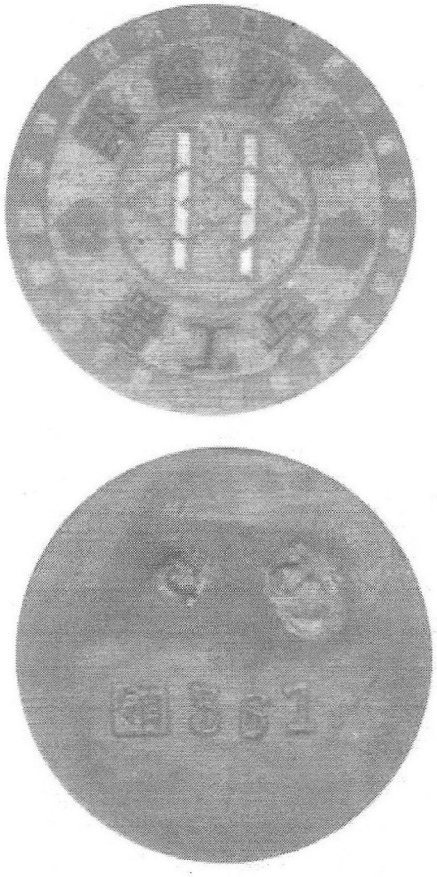
After the Revolution of 1911, Sichuan fell into disunity with the warlords constantly fighting for territory. The arsenal suffered severe damage, losses and was no longer functioning. The major machinery for manufacturing ordnance was moved to Chungking. In November 1938, the Ordnance Office assigned the engineer Zhen Daqiang (鄭大強) from the 50th Arsenal to oversee the reorganization of what remained of the Sichuan Arsenal. It was turned into an Ordnance School of the 50th Arsenal with some 300 students in 1939.

It was changed to a branch of the 50th Arsenal on July 1, 1941, producing mortar shells for the 60mm mortar and primers. The 47mm mortar shells were put into production in 1942. All the fuses and primers were designed by Arsenal personnel.

B. Arsenals in Other Areas

a. The 11th Arsenal

In 1912, Yuan Shikai 袁世凱 was elected as the first president of the newly formed Republic of China. At that time, the arsenals in the Republic were scattered and there was no centralized management. He established a "Centralized Arsenal Affair Office" (兵工廠統率辦事處) to manage matters.



Picture 48 Personnel badge for the 11th Arsenal.

In 1915, he established an "Arsenal Supervisory Office" (兵工督辦處) in Beijing. Its purpose was to build a new arsenal at an appropriate location as the model for all other arsenals. The location chosen was Xiao Yi city (孝義鎮), Gong County (鞏縣) in Henan Province.

On May 5, 1915, the Army Department requested expanding the scope of the arsenal to incorporate an artillery shell factory.

Previously, artillery shell machinery and factory plans had been purchased for Hanyang Arsenal. Also, the superintendent of the Hanyang Arsenal, Liu Qingen (劉慶恩) had just gone to Pratt & Whitney, Hartford, Connecticut, US, and signed a contract and to acquire new machinery, tooling and plan

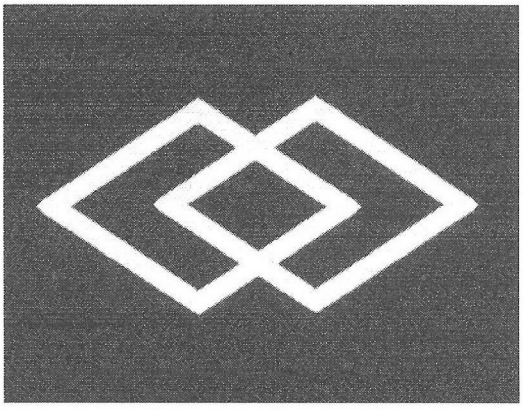
for a rifle factory. These would all be incorporated into the new arsenal.

The arsenal went into production of 75mm fragmentation shells in 1921.The machinery and tooling from Pratt & Whitney was installed in 1922. It had been sitting in warehouses in Shanghai since 1920 and had suffered various degrees of rust and corrosion. It was estimated that it would take at least 2 more years for the rifle factory to start production. In September, the Gongxian Arsenal (鞏縣兵工廠) officially came into existence. Lt General Jiang Tingzi (蔣廷梓) was appointed as the first superintendent.

The Gongxian Arsenal was one of the largest and most versatile arsenals under Ordnance Office management before the war.

It was the Gongxian Arsenal that first produced the Zhong Zheng Shi rifles in 1935. In addition, it also produced Russian pattern Maxims, Bergmann submachine guns, Mauser pistols, mortars and shells and aero bombs. There was also another factory nearby that produced gas masks and chemical agents.

Picture 49 A chemical factory nearby disguised as a Gong Xian's branch produced "Type 24" gas mask. The rate of production in 1936 was 250 pieces per day. Provided by LG.



Picture 50 The Arsenal mark of the 11th Arsenal.

After war broke out, it was ordered to relocate to Hanyang, Hubei, later changed to Chuzhou (株州), Hunan. The relocation began in November, 1937.

The arsenal was officially renamed the 11th Arsenal on June 1, 1938. In July, it moved to Yan Xi City (煙溪鎮), An Hua County (安化縣), Hunan. It was a remote area and the arsenal was built through the hills and valleys. A lot of infrastructures were inside dug out caves and the entrances were all well covered. The more dangerous power loading plant was set up in another location in Xu Pu County (溆浦縣).

The primary products were light machineguns, artillery shells, hand grenades and Zhong Zheng Shi rifles.

On November 11 and 12, 1939, just when arsenal production capacity had recovered, it was bombed by Japanese bombers. The site had somehow been discovered by the Japanese and attacked. There were more than 300 lives lost in the bombardment. The rifle factory suffered severe damage, and all office buildings were lost. Production ceased after the bombardment and workers were temporary housed in the nearby villages. The arsenal had to move again.
It was first decided to move the arsenal to Chunking. A liaison office was set up at

Tong Guan Yi (銅罐驛) on February 1, 1940. However, the Japanese launched a major offensive into the area in May, 1940, cutting off the passage to Yi Chang (宜昌) via the Yangtze River to Chunking. The arsenal was forced to return to Hunan. The superintendent Li Dai Chen (李待琛) went to the western regions of Hunan and found a natural cave in Xiao Ping (孝平鄉), Yuan Ling County (沅陵縣). The cave was three stories high and several li long. It was perfect protection against air raids and spacious enough for the arsenal operation.

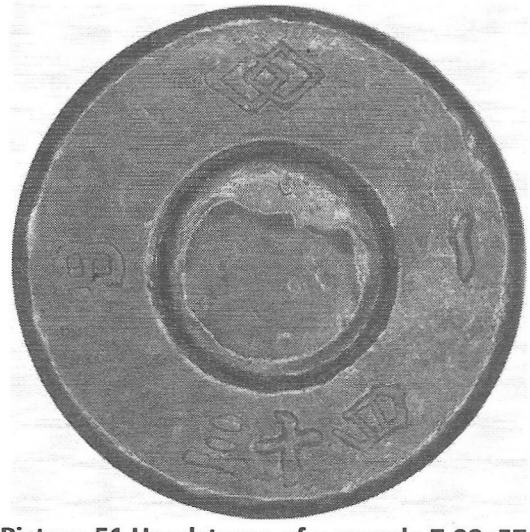
At that time, the rifle factory had already relocated to Tong Guan Yi, where it was merged into the 1st Arsenal. Some branches of the 1st Arsenal were still in Hunan - the ammunition plant, the machinegun plant and the artillery shell plant – which were then transferred to the 11th Arsenal.

Due to this exchange of facilities, the 1st Arsenal started producing rifles again. This time it was the Zhong Zheng Shi pattern and the 11th Arsenal started producing the Triple-10 heavy machine guns.

Triple-10 HMG Production					
1940	**1941**	**1942**	**1943**	**1944**	**1945**
514	520	310	260		1,737

Due to the merger, moves and bombing, the importance of the 11th Arsenal dwindled; there were comments about "falling apart during the moves." [9]

The 11th Arsenal remained in Hunan throughout the war.



Picture 51 Headstamp of a sample 7.92x57 cartridge produced by the 11th Arsenal. Woodin Laboratory Collection.

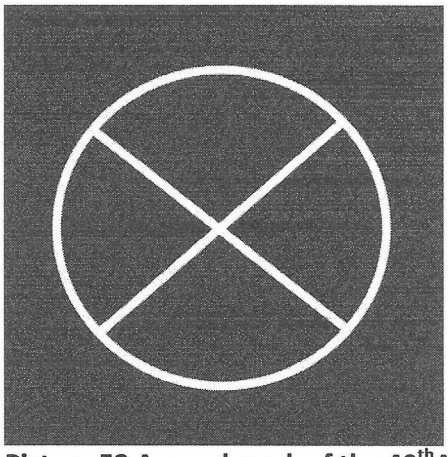
b. The 40th Arsenal

The 40th Arsenal was originally the Guangxi Arsenals. The Kwei clique of warlords owned 7 facilities capable of producing rifles, machine guns, cartridges, mortars and hand grenades.

After the outbreak of the war, Li Zongren (李宗仁) mobilized the province and to show willingness for unification, he handed over the arsenals to the Central Government. In September, 1937, the Ordnance Office sent Jiang Shao (江杓) to take over the arsenals. The facilities were consolidated into the 1st Arsenal of Gunagxi (廣西第一兵工廠), which employed some 2,000 workers.

It was relocated to Qi Jiang (綦江), Sichuan, in 1944 due to the advancement of Japanese forces. It was absorbed by the 21st Arsenal and became the Qi Jiang Branch of the 21st Arsenal.

[9] The Historical Records of Jiang Xu, Issue 28, The Changes in the Jinglin Arsenal during the War, Yu Zhuo Zhi.



Picture 52 Arsenal mark of the 40th Arsenal.

c. The 41st Arsenal

This was originally the Guangdong Arsenal (廣東兵工廠). The Guangdong Machinery Bureau was established to produce arms and gun powder in 1874. In 1887, a cartridge plant was established to produce ammunition for Mauser, Martini, Snider and Winchester rifles.

After years of development and expansion, it was one of the oldest and most versatile arsenals in China. Before the war, it produced rifles, machine guns, smokeless powder, machinery and bombs. There were 9 factories with some 2,300 workers.

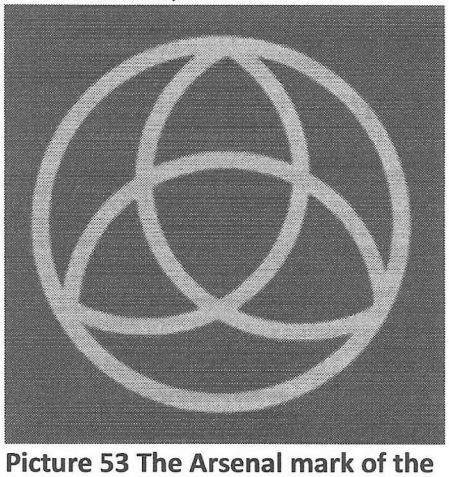
It was relocated to Rong Xian (融縣), Guangxi after the war broke out. The arsenal was renamed the 41st Arsenal in January, 1938.

On December 24, 1939, due to approaching Japanese forces, the 41st was ordered to move to Tong Zi (桐梓), Gui Zhou (貴州) province. The cartridge factory was ordered to merge with the 40th Arsenal and the bomb factory merged with the Gui Lin Artillery Repair Works (桂林修砲廠). The light machine gun factory of the 40th Arsenal was merged with the 41st Arsenal. After the machinery was dismantled, it was shipped to Du Shan (獨山) and then Tong Zi by trucks. The secondary machinery was shipped via rail to Sichuan.

In September of 1941, the arsenal reported that its principal products had been Zhong Zheng Shi pattern rifles and Czech pattern light machine guns. The total output had been 2,200 LMGs and 7,000 rifles since production had resumed in 1940. The monthly output was 260 to 300 LMGs and 1,100 to 1,300 rifles barring any materials or personnel shortages.

At that time, there were 8 production factories: the 1st produced rifles, the 2nd produced LMGs, the 3rd maintained machinery, the 4th milled the LMG chambers, barrels, parts and produced jigs, the 5th was responsible for power generation and water supply, the 6th cast iron, the 7th making molds and soldering, and the 8th was the wood works.

In September of 1944, the Ordnance Office reported the monthly production of the 41st Arsenal was 1,000 rifles and 300 LMGs.



Picture 53 The Arsenal mark of the 41st Arsenal.

d. The 51st/53rd Arsenal

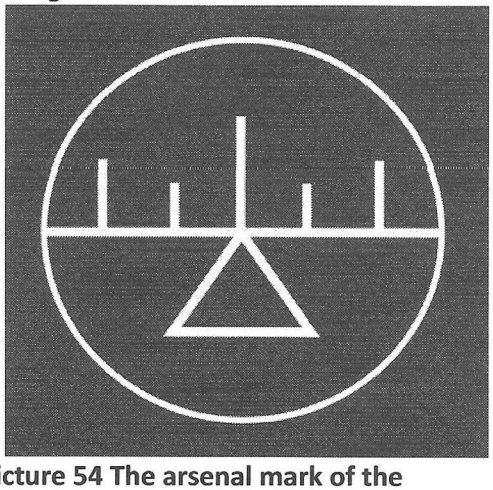
Before the war, the Ordnance Office had decided to adopt the Danish Madsen as the standard universal machine gun. The full set of tooling and drawings were procured and

other machinery was also obtained from various sources. On April 1, 1941, the 51st Arsenal Preparatory Office was established; the arsenal was to be located at Shan Chong (山沖), Hai Kou (海口), Kun Ming (昆明), with a production target of 500 guns per month.

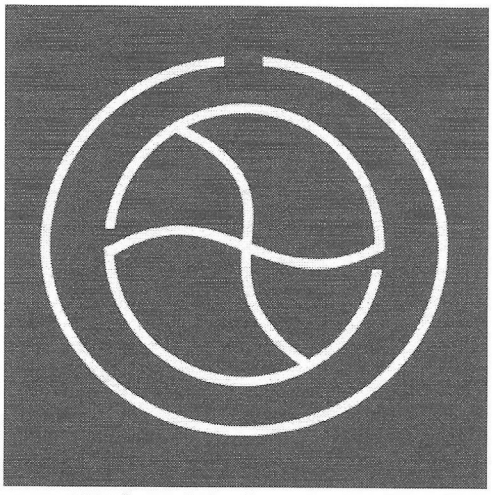
Unfortunately, the drawings and the tooling were lost in an air raid on the Burma Road in June, 1940. The plan had to be changed to go back to ZB-26 pattern production. The first batch of 100 guns rolled off the production line in June 1941.

In January, 1942, the 51st and the 22nd were ordered to merge to form the 53rd Arsenal. The 22nd primarily produced optical equipment. The 53rd continued to produce ZB-26 and optical equipment as its main products.

The volume of ZB-26 produced in the 53rd was the largest among all arsenals; however, due to the remote location and lack of skilled workers, the product quality was the worst. The gun often wouldn't fire automatically and sometimes even discharged with the bolt open, causing damage to the receiver.

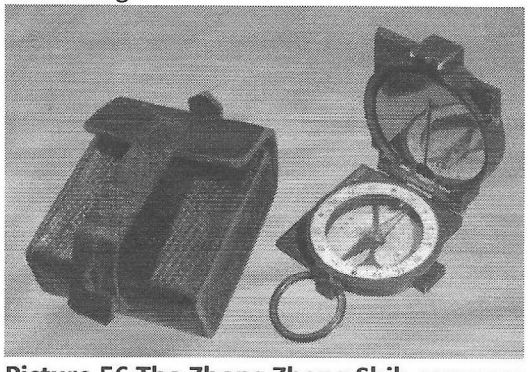


Picture 54 The arsenal mark of the 22nd Arsenal. It was retained and became the arsenal mark of the combined 53rd.



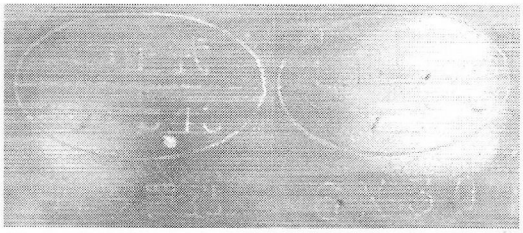
Picture 55 The original arsenal mark of the 51st Arsenal.

By the end of the war, the 53rd Arsenal had produced 14,920 ZB-26s, 11,480 Model Zhong Zheng Shi binoculars, 27,750 compasses, 297 range finders and 2,608 mortar sights.

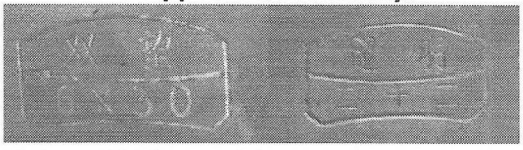


Picture 56 The Zhong Zheng Shih compass produced by the 53rd Arsenal.

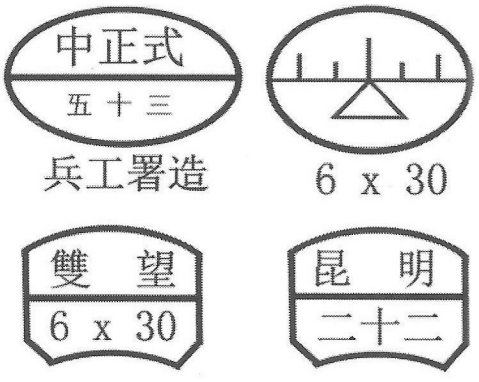
Picture 57 The Zhong Zheng Shih 6x30 binocular and leather carrying pouch.



Picture 58 The markings on the Zhong Zheng Shih 6x30 binocular. It was repainted and the paint was subsequently ground off to show the markings. The paint has been stripped off chemically.



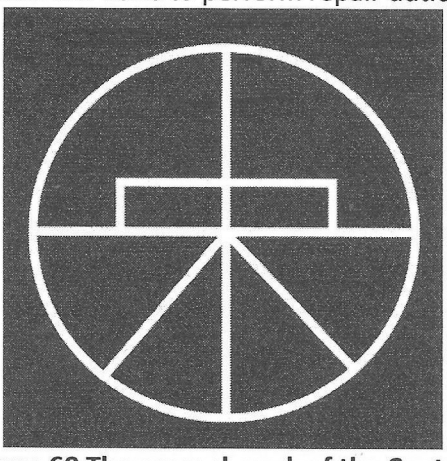
Picture 59 The markings on an very early Zhong Zheng Shih 6x30 binocular. Right: Kunming, 22. Left: Double tube(There was a single tube version as well.), 6x30. The paint has been stripped off chemically.



e. The Central Arms Repair Depot – the 44th Arsenal

The 44th Arsenal started out as the Central Arms Repair Depot (中央修械所) in Nanjing, July, 1936. It was evacuated in December, 1937, before the fall of Nanjing to Hunan. It occupied the old site of the defunct Hunyang Ordnance Bureau (湖南軍械局) in Hunyang (衡陽).

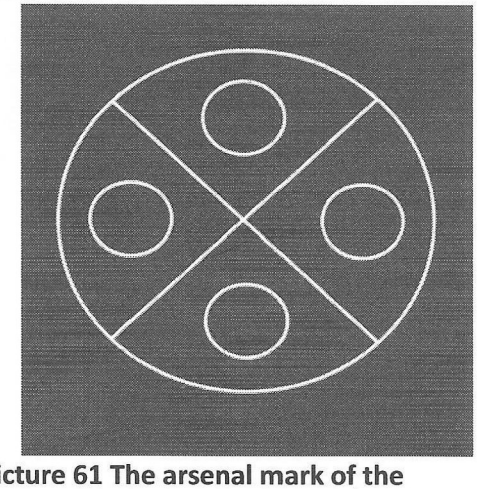
Again in the winter of 1938 it was relocated to Guizhou and took over the Guizhou Arms Repair Depot facility (貴州修械所). It formed the Mobile Repair Units (遊動修理隊) that year and started sending them out to each war zone to perform repair duties.



Picture 60 The arsenal mark of the Central Arms Repair Depot.

It was further expanded in the spring of 1940. The mobile units were further divided into smaller units such as repair squads, repair teams and attached to troops in the field as their main repair resources. A new location was found and the new facility was built in the summer of 1940. The Yuanlin Artillery Workshop (沅陵修炮廠) was merged into the Repair Depot.

The production of Smith & Wesson .32-40 revolvers and hand grenades started in the fall of 1942. The arsenal name was changed to the 44th Arsenal in June, 1943. It continued to manage the mobile repair units in the field.



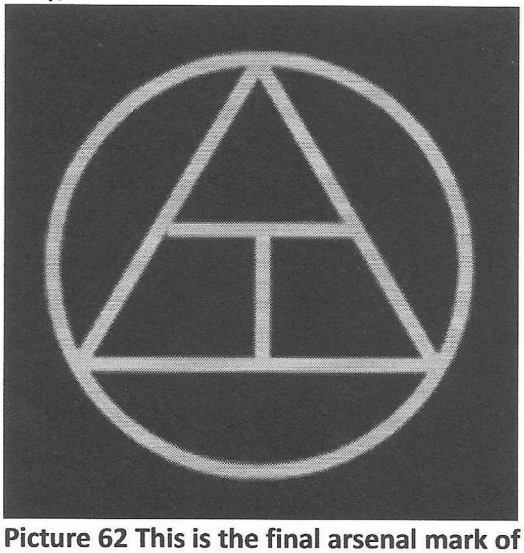
Picture 61 The arsenal mark of the 44th Arsenal.

The 43rd Arsenal in Kweiling was merged into the 44th in 1944. At that time, there were some 2,000 workers in the 44th Arsenal.

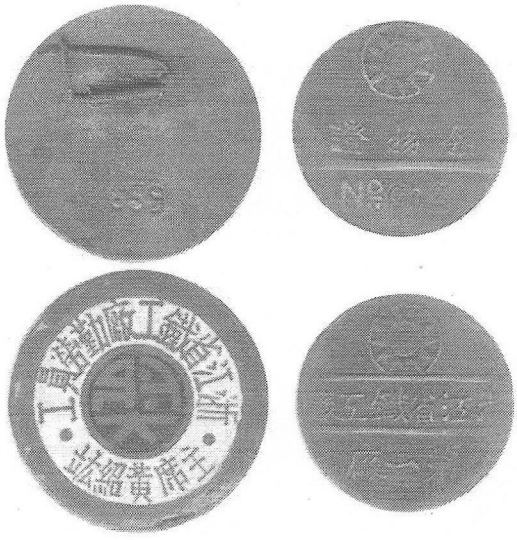
C. Other Arsenals

a. Zhejiang Iron Works (浙江鐵工廠)

In December of 1937, the Nationalist Central Government sent Huang Shaohong (黃紹竑) to be the governor of Zhejiang Province. To arm his provincial self defense forces (自衛部隊) and utilize the skilled workers and machinery evacuated from Hang Zhou (杭州) and Ning Po (寧波), Huang decided to set up his own ordnance production facility. Production started in May, 1939.



Picture 62 This is the final arsenal mark of the Zhejiang Iron Works, which evolved from the original 七七mark.



Picture 63 Badges for materials requisition and goods workers award from Zhejiang Iron Works.

It started out only producing rifles based on the Belgian 1924/30. However, there were some small changes made to simplify production. Initially the daily output was four rifles. After a series of expansions, there were four factories; Factory 1, with the most workers was at Xiao Siun (小順), producing rifles and rifle grenade launchers., Factory 2 was at Shi Ton (石塘), producing light machine guns, Factory 3 was at Yu Si (玉溪), producing explosives and hand grenades, and Factory 4 was at Da Gon Tou (大港頭), concerned mainly with producing machinery for other factories. There were some 2,000 workers all together.

All arms produced by the Zhejiang Iron Works were named by Huang as Type 77 to commemorate the July 7 Incident at the Marco Polo Bridge.

A report dated July, 1939, by T.M.H. Pardoe[10] gave the monthly production capacity as:

- LMGs：75-100

10 Linguistic Officer, Worcestershire Regiment, British Embassy, Beijing.

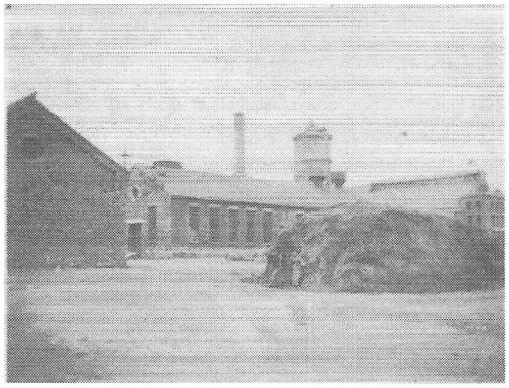
- Rifles：360
- Cartridges：300,000
- Bomb & Hand Grenades：60,000
- Grenade Launcher：

By 1941 the arsenal employed some 4,000 workers, operating over 1,000 machine tools. It could produce over 1,000 rifles, 50 machineguns, and 50,000 to 60,000 grenades per month. In March, 1941, with the implementation of the central government policy of unified arsenal administration and armament standardization, the arsenal came under Ordnance Office control. In May, 1942, the advancement of Japanese forces forced the move of the facilities to Nanping (南平) county in Fujian (福建) province. Later the factories were set up at Sha Men (沙門), Xi Qin (西芹) and Xia Yang (峽陽), under the Special Administration, Southeastern Region, Ordnance Office (兵工署東南特派員公署).

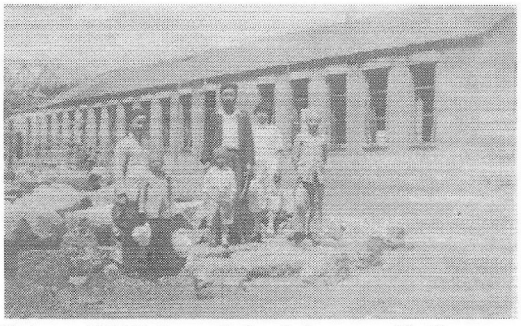
A production record of the Nanping Factory, Southeastern Region, in a 1944 Ordnance Office Report gave monthly production figures as 400 rifles, 10 82mm mortars and 40,000 hand grenades. The production figure fell in 1945 to 10 82mm mortars, 25,000 hand grenades and no rifles.

b. Shenxi Arsenal

Yan Xishan (閻錫山) came into power after the Republican Revolution in 1911 and became the de facto ruler of the province for the next 38 years. In 1917, he was officially appointed as the governor of the province by the Beijing government. He adopted a neutral stand among the in-fighting warlords, focusing on building up his own strength. It was at this time he started the expansion of the arms production capability. He was very successful in building one of the largest military industrial complexes in China. It was known that the soldiers from Shenxi were the only soldiers with canned food in combat.



Picture 64 One of the production facilities of the Shenxi Arsenal. Courtesy of Andy Sun



Picture 65 Picture 1 Andy's grandfather was the superintendent of Shenxi Arsenal. Here is a family photo taken in front of the facility. Courtesy of Andy Sun.

In 1920, he formally set up the arms production factory under the disguise of "Shenxi Soldiers' Artisan Apprentice Factory" (山西軍人工藝實習廠). Records show that he started purchasing materials, machinery and hiring experienced managers and engineers from the Shanghai and Hanyang Arsenals to run the facility.

The name of the arsenal changed quite a few times. Known names in addition to the ones given above were Taiyuan Arsenal (太原兵工廠), Ren Shen Manufacturing (壬申製造廠), and Northwestern Enterprise (西北實業公司).

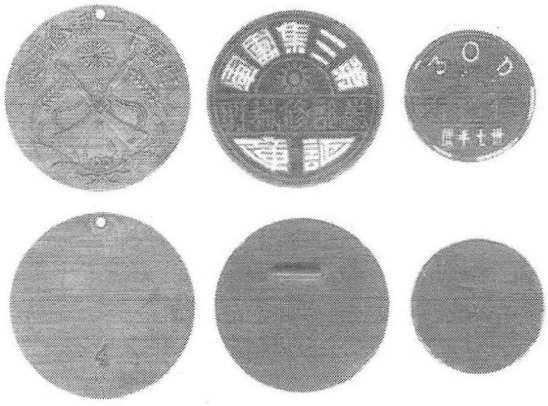
In 1937, the invading Japanese forces quickly entered Shenxi and took Taiyuan. Some equipment was evacuated with Yuan to the west. One factory moved to Shaanxi (陝西) and the other factory moved to Sichuan. It continued to produce rifles, heavy machine guns, light machine guns and Thompson sub-machineguns. Due to the loss of 6.5mm cartridge production facilities, all arms were switched to 7.9mm caliber.

Picture 66 The quasi-currency coins issued by Yuan for the Shenxi Arsenal workers.

The output was mostly supplied to Yuan's troops in the 2nd War zone except the one factory moved to Sichuan, which was eventually taken over by the Ordnance Office and became part of the 31st Arsenal, known to produce ZB 26 pattern LMGs.

During the war, the arsenals started out utilizing semi-finished parts to assemble arms. Later it had to use railroad rails as raw materials, producing light machine guns at Cheng Gu (城固), rifles at Xiang Ning (鄉寧), and pistols at Xiao Yi (孝義). The highest output was 800 rifles, 300 LMGs, a dozen pistols and over 10,000 grenades per month.

D. Repair Depots and Chinese Communist Guerilla Ordnance Facilities



Picture 67 Three various troop level Repair Depot personnel badges.

The Chinese Communist guerillas were actively operating in various enemy-occupied areas during the war. Soon after the war broke out, the Communist stopped taking orders from the Nationalist Government. In response, the Government stopped supplying arms and ammunition to the Communist troops. The Communist had to find other sources for weaponry. Some weapons were obtained from civilian-owned firearms and some were battlefield pickups from the Japanese forces, but a lot of them were actually purchased from the puppet army and other armed forces. The Central Committee of the CCP instructed each fighting base to figure out a way to re-supply weapons and ammunition. Later, a decree came from the Central Committee to stop any ordnance manufacture but focus instead on reloading cartridges and manufacturing, hand grenades, black powder and land mines. Apparently not all Commanders followed that decree, as during later stage of the war, some places could and did produce small amount of rifles, pistols, machine guns, and grenade dischargers and so on. Some could even produce smokeless powder, new cartridges, mortars and mortar shells.

There were repair depots in the larger units (Army and Corps level) in the Nationalist forces. The Transportation and Armor units typically would have some machinery. These units would also produce some small arms in their spare time. The people who were making arms typically learned their skills from the previous workers. They followed the exact steps but had no understanding of the reasons or theories behind it. One of the old workers stated that the pistol receiver had to be heated with dog bones but he didn't know why. In reality, the casehardening process could be with leather, cow bones or any other high carbon content organic matter to impart a hard surface to the steel.

The main problem for this type of arms making was the availability of raw materials. One record showed that a workshop behind enemy lines could produce almost everything except springs. It had to send people to slip through the blockade to the enemy occupied city to acquire them.

E. Arsenals were Incomplete or Shutdown

a. The 2nd Guangdong Arsenal

In July, 1933, the governor of Guangdong Chen Chi Tang (陳濟棠) negotiated a deal with Hans Klein to purchase an artillery plant from Hapro[11] via Siemens & Co.. The site selected was at the mouth of Pa Jiang (琶江) Qi Hu Tang (企湖塘), Ching Yuean (清遠), Hua County (花縣). It was to produce artillery shells, field guns, gas and gas masks.

Chen was later deposed and exiled to Hong Kong and the arsenal was never completed. Some of the machinery was transferred to the 50th Arsenal. The remaining buildings were destroyed in a Japanese air raid.

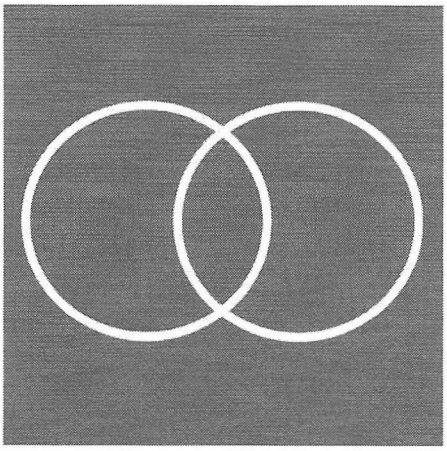
Picture 68 The personal identification of a 50th Arsenal employee in leather case.

b. The 10th Arsenal

The 10th Arsenal was originally the Artillery Technical Research Institute. It was the organization responsible for the construction of the large artillery factory planned in Zhuzhou, Hunan.

Some of the machinery started to arrive in June, 1938. The munitions machinery was transferred to the 25th Arsenal and the Institute itself was relocated to Zhong Shu Tuo (忠恕沱), Chungking.

[11] Hapro -Handelsgesellschaft fur industrielle Produkne - was a trading company owned by Hans Klein. However, it was generally believed that it was a frontfor the Reichswehr and German ordnance companies.



Picture 69 The arsenal mark of the 10th Arsenal.

More machinery arrived in June, 1940 and production gradually started. It was renamed the 10th Arsenal on January 1, 1941, with 597 workers. When the war ended, there were 2,556 workers in the arsenal.

The main products were fuses, 20mm Solothurn tracer projectiles and various explosive shells. It also produced Russian pattern 37mmm HE shells, 37mm AT shells and 60mm mortar shells.

On February 21, 1943, a new 60mm mortar design was successfully completed. The arsenal produced 400 mortars that year and increased to 950 in 1944 and 1,420 in 1945. The model was a different pattern from the one produced in the 50th Arsenal but both were manufactured concurrently throughout the war.

c. The Shanghai Arsenal

In June, 1865, Su Song Tai Dao (district governor) (蘇淞太道) Ding Ri Chang (丁日昌) reported to Viceroy Li Hong Zhang (李鴻章) that customs official (海關通事) Tang Guo Hua (唐國華), with the support of Customs Inspector General Robert Hart, Customs Director Guo De Yan (董事郭德炎), Zhang Can (張燦) and Qin Ji (秦吉) together had put together 40,000 taels (兩) and bought an American owned iron works factory, Thos. Hunt & Co. (美國旗記鐵廠) in the Hong Kon (虹口) area of Shanghai. They were hoping to redeem themselves by submitting the factory to the government.

In September 1865, Li Hong Chang reported the establishment of the Jiangnan Manufacturing Bureau (江南製造局).

There were many expansions to the arsenal in the following years, adding powder works, gun factory, cannon shell factory, sea mine factory, boiler factory and cartridge factory. Remington Rolling Block rifle production began in 1884. Kuaili rifle production started in 1891. The Kuaili was a copy of the Mannlicher Model 1888 Rifle. It is the oldest and at one time the largest arsenal in the history of the modern Chinese ordnance industry.

Picture 70 A student's report card issued by the Jiangnan Ordnance School in 1909 (宣統元年).

In 1912, the Army Department replied to a inquiry from the Xing History Archives (清史館) regarding the history of Jiangnan: The arsenal was in the southern part of Shanghai city at Gao Chang Miao (高昌廟), a branch factory in Long Hua (龍華), gun powder storages were in Pu Dong (浦東) and Jiang Yin (江陰). The arsenal could produce 3,000 rifles and 10 million various

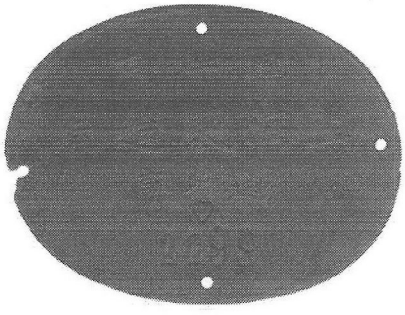
cartridges per year. The steel works could produce 1,500 tons steel per year. There were a total of 5,000 technicians, laborers and apprentices in the arsenal, which was under the administration of the Army Department.

Starting in 1916, there are records regarding 7.65 Browning 1900 pattern pistols with 6" and 8" barrels in production.

Picture 71 The Type 4th Year Light Machine Gun made in the Shanghai Arsenal. It's a Hotchkiss pattern. Beijing Military Museum.

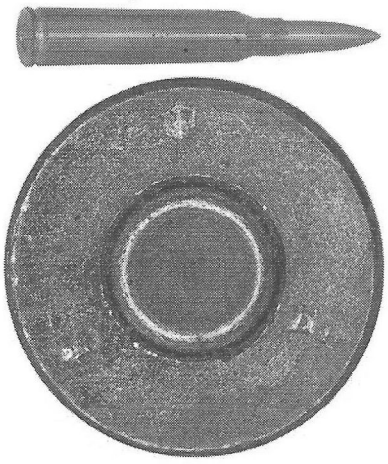
In 1917, production output was 37 Type 4th Year 7.9 machineguns, 400 Type 1st Year 7.9 rifles and 285 6" barrel pistols.

On January 28, 1932, the Japanese attacked the Chinese troops' positions in Shanghai and a large scale conflict erupted.



Picture 72 Shanghai Arsenal period personnel pass.

After the conflict, a truce was signed and Shanghai was declared a non-military zone. The ordnance production portion of Shanghai Arsenal was to be shut down. Some machinery was shipped to Hung Zhou, some was shipped to Jingling Arsenal and the rest was put into storage.



Picture 73 Headstamp of a 6.8x57 cartridge produced by Shanghai Arsenal in 1915. Woodin Laboratory Collection.

Jiangnan was the first Machinery Bureau established by China's modernization movement. It not only produced arms but also led the modernization efforts in education and translation. It trained a significant number of skilled ordnance personnel which were later scattered all over China.

d. Eastern Three-Provinces Arsenal (aka Mukden Arsenal)

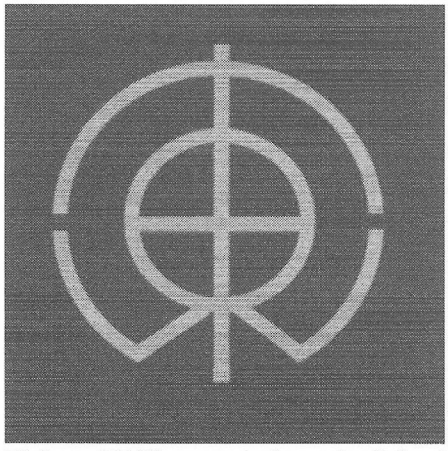
Around 1921, Zhang Zuolin (張作霖) set up a repair shop and cartridge factory within an old mint. The name was later changed to Feng Tien Ordnance Factory (奉天機器局).

The Feng Tien Ordnance Factory was renamed the Eastern Three Provinces Arsenal (東三省兵工廠, short for Northeastern Three Provinces) in 1922. Its location was at the outskirts of the eastern gate of Shenyang (瀋陽) City. A new rifle factory, a cannon shell factory and a cannon factory were constructed with machinery contracted from the Danish company Nielson & Winther. Winther assigned a technician, Christen Herman, to supervise the machinery installation. On the west end

of the warehouse, a railroad platform was built and the railroad tracks were extended there so the train could run directly into the factory.

Picture 74 The personnel badge of the Eastern Three Provinces Arsenal.

Between 1926 and 1928, the Eastern Three Provinces Arsenal went through several great expansions. The Rifle Factory and Light Machine Gun Factory were added. There were over eight thousand machines in the factories and it became the largest and most advanced Arsenal in China.



Picture 75 The arsenal mark of the Eastern Three Provinces Arsenal.

It produced smokeless powder, explosives, cannon and shells. In terms of small arms, there were Type 13 rifles, Type 13 heavy machine guns and Type 17 light machine guns. It not only produced large quantity of arms but reportedly that the products were also of very high quality.

In 1929, the Ordnance Office record referred to it as the Liao Ning Arsenal (遼寧兵工廠), daily output was 130 Type 13 Rifles and 410,000 cartridges. Annual output was 300 Type 17 light machine guns, and 50 Type 13 heavy machine guns. There were 17,000 workers in the arsenal and it continued to expand.

In 1931, a semi-automatic rifle was successfully tested, believed to be based on the Czech ZH-29 pattern. On September 18, 1931, the Japanese Kwangtung Army blew up a section of the Manchurian Railroad and started the "918 Incident". In under four months, Japanese forces controlled the whole Eastern Three Provinces territory and the Arsenal fell into the hands of the Japanese Kwangtung Army.

The largest arsenal in China then became one of the four arsenals Japan had in WWII.

e. Taku Dockyard

The Qing Government asked Viceroy Li Hongzhang to take charge of Beiyang Coast Defense (北洋海防) in 1875. To build up defensive strength 25 ships were procured from Germany and Britain. In order to maintain this fleet, Li proposed to establish a dockyard in northern China. The Taku Dockyard was established in 1880 and officially named "The Beiyang Fleet Taku Dockyard" (北洋水師大沽船塢). Construction was completed in November.

All materials and machinery in the dockyard were procured from abroad. It continued to expand; there were iron works, a boiler factory, cast iron works and a mould factory. There were also 6 ship docks.

Arms production started in 1891. It first produced 90 German pattern 1 pound artillery pieces. The following year, an Artillery Factory was added to the Dockyard concentrating on artillery production. During the Sino-Japanese conflict in 1894, it not only repaired damaged ships but also started making sea mines.

In 1913, the Dockyard was put under the Naval Department and it started building military and merchant ships.

The Dockyard obtained a Maxim heavy machine gun in 1916 and successfully copied it in 1917. A special feature was that the Taku Maxim had the rear sight calibrated for both spitzer and round nose cartridges.

The Artillery Factory was expanded in 1928, adding an Inspection Office and the #1 Cannon Shop. It started the production of Mauser pistols and carbines.

The MP-28 II Bergmann Submachine gun was successfully copied in 1926. The Taku guns had the magazine turned downwards, the caliber was 7.63, and the magazine was held 50 rounds.

The ZB-26 was also first successfully copied in the Taku Dockyard in 1927, in caliber 7.9mm.

In December, 1935, the Ordnance Office ordered the Taku Dockyard to cease arms production. The quantity of small arms produced in Taku wasn't very large but they were among the best in quality.

After the 29th Route Army took charge of the defense of northern China, small arms production resumed in Taku at some point, according to Commander Song's son.

Picture 76 Wartime wood print titled "The Two Generations" by Li Hua, Wood Print Selections of the 8 Year War of Resistance, first printing, Kai Ming Bookstore, December, 1946.

Chapter 3. Pistols

Section 1. Pistols Used in the Military

From a military perspective, pistols are self-defensive weapons. The bullets fired have much lower initial velocity compared to the bullets fired from rifles and hence the effective range is limited. Rifles usually are fired from a more stable position and hence the shooting is much more accurate than that of hand held pistols. The effective range for pistols are usually 50 meters or less, which is pretty close, so a pistol should be considered as a last resort weapon.

As in other armies the Chinese Army issued pistols during the war. In addition to officers, special services troops such as Engineers, Radio, Medical, Machine Gunners, etc. were armed with pistols as well. Based on the Type 21st Year TO&E, there were 12 Mauser pistols in an Infantry Company. Also, there were 2 pistols listed for Battalion HQ; it noted that the pistols were either a Browning automatic or a revolver. The Browning here meant 1900/1910/1922 types, not the Browning Hi-Power for it had not yet entered into production.

The other note stated that only mid-level officers and below were issued Mauser pistols. Any officer above Major would be issued with a "pistol."

A Machine Gun Company was listed as having 35 Mauser pistols, one Artillery Company was listed as having 36 Mauser pistols and an Infantry Battalion would have 99 Mauser Pistols in total.

The Mauser pistols with the shoulder stock could be somewhat considered as a carbine. It could play a role as an active combat weapon.

Just like anywhere else in the world, high ranking officers, especially unit commanders, , armed themselves with what they pleased. Some of these were battlefield captures; some of them were private purchases or gifts. There was hardly any standard.

There were no major arsenals in China producing pistols in quantity during the war. The only arsenal that officially produced pistols was the 44th Arsenal. The revolvers produced there probably were assembled from parts imported from Smith & Wesson.

The arsenals producing Mauser pistols in the 30's all ceased production except for the relocated Shanxi Arsenal. Some repair depots and small facilities may have produced some pistols during slack times but the quantity was limited.

Some troops under the older organization charts still had a Pistol Company or Pistol Battalion. These were special services troops, who functioned more as body guards or various escort and transportation type of duties, not front line combat units. There were also so-called "Storm Troops" (敢死隊), who were volunteers organized as needed and armed with one or more pistols per soldier.

Higher ranking officers were usually armed with small caliber pistols; the higher the rank, the smaller the caliber. The 7.65x17mm caliber was the most popular. The standard war time pistol ammunition produced was primarily 7.63x25mm. Soldiers using other caliber pistols were on their own when it came to seeking a supply of ammunition. In reality, pistol ammunition consumption wasn't very great. When

someone ran out of ammo on the battle field, they probably wouldn't have a chance to come back for more.

Section 2. Domesticall y Produced Pistols

I. Mauser Pistols Produced by Gongxian , Hanyang, and Taku

Picture 77 Mauser pistol produced by Hanyang Arsenal in 1926. Note the front sight on a muzzle ring.

Mauser Pistol Specifications
Operation Method: Short Recoil
O/A Length：288mm
Barrel Length：132mm
Caliber：7.63x25mm
Weight：1.16kg
Muzzle Velocity：425m/s
Feed：10 round internal magazine, other options available

The official name for the Mauser Model 1896 pistol was Mauser Military Pistol. In China, it was also"Box Cannon" (盒子炮), "Boxed Gun" (匣槍), Zi Lai De (自來得), Bo Ke Qiang (駁(卜)殼槍). Starting from the beginning of the Republic, this was the most popular pistols all the way through the 1950's. It was not just a military gun; civilian and all types of other more colorful "characters" were attracted to this pistol. Zi Lai De was the most widely used official name in government documents.

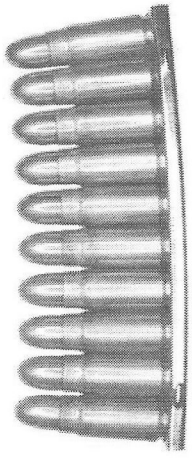
According to common belief, the pistol was designed by Fidel, Friedrich & Josef Federle, who were three brothers working for Mauser that designed the pistol in their spare time. It was a time when the military was just starting to issue semi-automatic pistols to troops. Mauser named the pistol Military Pistol in the hopes of winning some major contracts. Unfortunately, no major nation in the world ever officially adopted the Mauser Pistol. Production continued until 1939. It is estimated that there were some one million of various types made. Probably half of them ended up in China one way or another.

Picture 78 A period postcard from during the 813 Shanghai Incident,showing a soldier with a bolo Mauser pistol next to a light machine gunner..

Due to the demand, there were at one time or another many different sources copying Mauser pistols in China. The larger arsenals that produced Mauser pistols were Hanyang, Shanghai, Gongxian, and Shanxi.

Hanyang probably was the largest producer of Mauser pistols in China with both regular and short barrel versions. The Hanyang Mauser pistols all have the front sight soldered on. The original Mauser pistol made in Germany had both soldered on and machined on front sight versions. There were also other smaller facilities, repair depots and mobile gunsmiths travelling around the countryside making them. The quality varies a great deal.

Taku Dockyard was one of the best quality producers. It produced at least six different variations. The flat sided version was marked "Taku Dockyard" in English; the one with beveled sides was marked "Taku Ship Yard" (大沽造船所) in Chinese.



Picture 79 Stripper clip with 10 cartridges for the Mauser pistol.

There were four major sources of Mauser pistols in China:

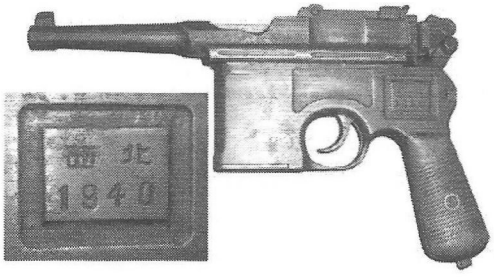
1. Those produced in formal arsenals with machine tools: These were better in workmanship and materials. They still heavily relied on hand fitting but, in general, the quality was quite good. These arsenals included Hanyang, Shanghai, Gongxian, Taku, Shanxi, Chunking Repair Depot, and Hengyang. Mauser pistol require making a lot of small parts, hence a lot of machine time is required. A report dated 1922 stated that a Hanyang rifle cost was 43 Yuan but a Mauser pistol cost 120 Yuan. When the war broke out, there were no arsenals producing large quantities of Mauser pistols. An Ordnance report stated that "1935 purchasing pistol quantity...the Office in conjunction with the Berlin Commerce Representative processed all related import matters...20-shot Zi Lai De pistol cost 80 Yuan, a revolver cost 30 Yuan and a 4 or 6-inch barrel Browning or Mauser pistol cost 30 Yuan."[12]

Picture 80 Two2 different Chinese made Mauser pistols. Top: Shanxi made, below: Hanyang made. Source C.

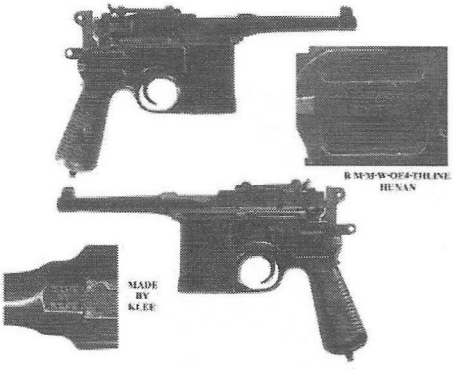
2. Those produced in Repair Depot, Branch and other Facilities: These were ordnance repair depots, whose primary task was to repair defective weapons, vehicles and such. They owned some machinery and they would also produce some small arms in slack periods. The quality was solely dependent on the availability of materials to them. Some depots behind enemy lines during the war had to use railroad track as their

[12]Ordnance Office Technical Branch Report, 1934, Yu Da Wei.

source of steel.



Picture 81 A bolo Mauser pistol made by an unknown source. The marking translates to "Northwest, 1940." Courtesy of Miduo.



Picture 82 A bolo Mauser pistol made by the Hunan Iron Works. The markings are in somewhat cryptic English.

Picture 83 A bolo Mauser pistol produced by the "Repair Depot of the 2nd Warzone" in 1939, as stated on the left side of the gun, serial number 002. Courtesy of Miduo.

3. Those produced by private gun-making shops: This was a special occupation. Before the war, there were many of these small shops in Hebei, Henan and Sichuan, who travelled around the countryside and made guns to order. For the most part, these guns were made by hand with dubious materials. They look serviceable with all original markings – although sometimes the markings would be just nonsense. This was probably due to whomever they had learned the skill from never having seen an original one. The quality of these guns again depended on the person making it and the material they used. Some could be downright dangerous to shoot. In general, these guns would have poor surface fiish and theywould have an obvious hand made look.

4. Those that were imported. There were foreign importers in large cities such as Tientsin and Shanghai. These companies would broker weapons for government and civilian alike. On large scale purchases, the government would have its own agents abroad to negotiate directly with the manufacturers.

Picture 84 A short barrel Mauser Pistol made by Mauser. This is generally called a "bolo" pistol. The name came from "Bolsheviks," from the Russian Revolution. It was said that the 3.9 inch barrel Mauser pistols were their favorite weapons.

Picture 85 Two Chinese produced bolo Mauser pistols, Shanxi made (above) and Hanyang made (below). Source C.

After WWII, the Western Allies took charge of the Mauser factory for some reason ordered the destruction of all Mauser factory records. All the research notes, changes, production records and such went up in flames. As a result, collectors have had to cross reference existing specimens for variations and serial numbers to piece the original history together.

Based on appearances, there were quite a few variations:

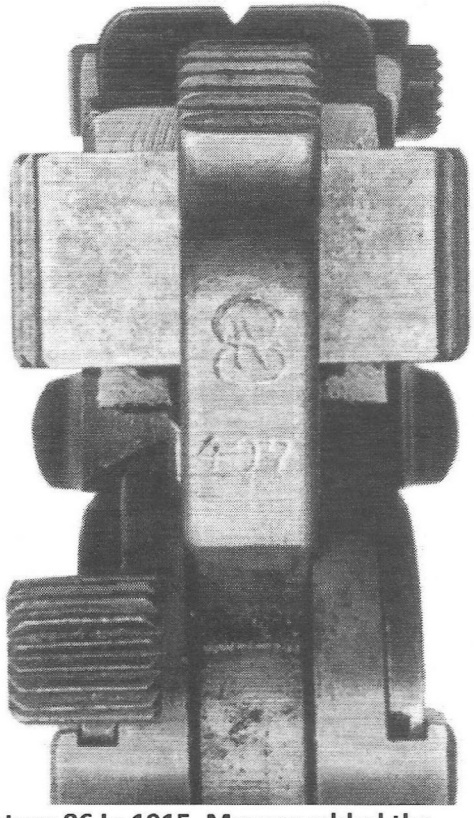
Hammer hole: The earlier version had the cone-like protrusion, later it became a large hole and the final version was a small hole. The Schnellfeuer had yet another kind of hole. There were about six different variations.

Circular marks on the hole. There were also several different types.

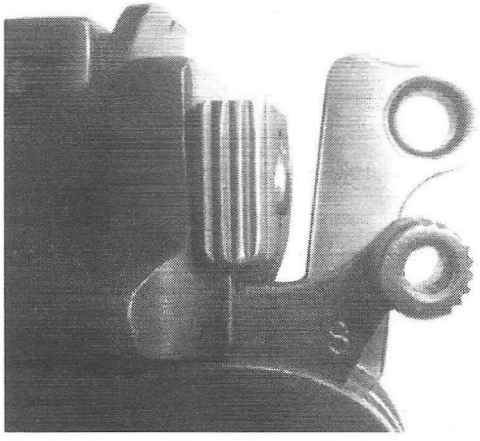
Cuts on the receivers: The earlier ones had the lightening cut, then it was the flat side and the final version returned to the lightening cut. There were at least 12 different types.

Grips: The Red 9 version was distinct and there were two types. Other versions had about 15 different types.

After 1930, the new safety was added to all new guns. When the safety is on and the trigger is pulled, the hammer would fall harmlessly. There were three different safeties prior to this final addition.



Picture 86 In 1915, Mauser added the "New Safety" feature to some of its guns. To apply the safety, the hammer had to be pressed down slightly while in the cocked position.

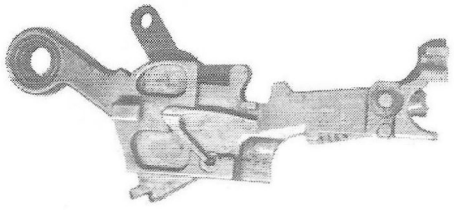


Picture 87 After 1930, Mauser changed the safety again. Pulling the trigger would allow the hammer to fall when the safety was on but the hammer wouldn't contact the firing pin. This type of safety catch was marked S and F.

Firing pin: The early version was locked by a locking piece. This was changed to a single lug and a twin lug in the final version.

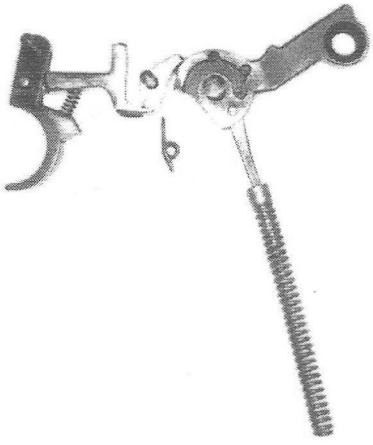
Extractor: Large and small.

There were also variations in barrel length, rear sight configurations, markings applied, etc. Looking at all of the above features on one gun, one can approximate the production date of that particular gun. However, Mauser did reuse some old parts in new guns so this is not 100% foolproof either.



Picture 88 The internal mechanism of the Mauser pistol; no pins, no screws, just a lot of parts that fit together.

During the 1920's, the warlords were fighting over territory and power in China. Spain started producing Mauser pistols clones. Some of these clones had simplified internal mechanisms to cut production cost and production cost was lower in Spain to begin with. The quality of Spanish "clones" was not bad and they soon gained a strong foothold in the China market.

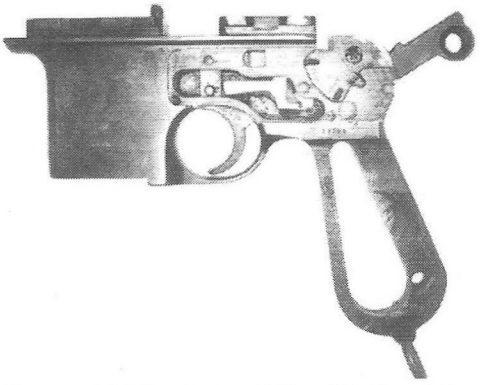


Picture 89 The Astra 900 trigger and hammer arrangement, which does use pins and springs.

Picture 90 As shown in the above picture, there are eight pins on the Astra 900.

Picture 91 The Astra 900 pistol – Mauser.

The right most pin is used to remove to magazine floor plate detent and is normally not touched (note its perfect blue on this gun). The Chinese nicknamed the Astra 900 as the "Seven-pin Boxed Cannon". In fact, there is another internal pin so actually there are a total of nine pins.



Picture 92 The Astra 900 with the side panel removed, revealing the firing mechanism, which is very different from that of the Mauser pistol.

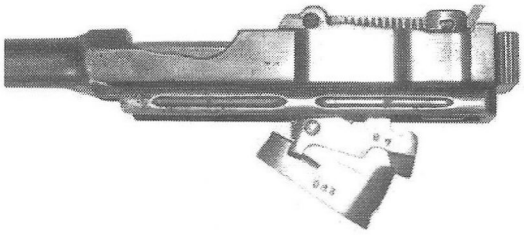
『By the order of the Generalissimo, Chunking was to purchase 5,000 20-shot "Boxed Cannon." A search showed that there were one original Mauser and two Spanish copies available. The Spanish Astra was cheaper by 1.7 Yuan per gun.』

March 12, 1934, Assistant Manager Li Yaohuang (李耀煌) Report, Central Trust of China (中信局)

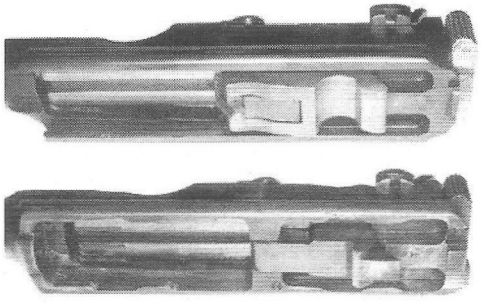
The "Box Cannons" from Spain came from three different sources – Astra, Azul and Royal. The Astra and Royal were similar to Mauser pistol in appearance only. The internal designs were completely different. They utilized pins and springs and the design more closely resembled that of a more conventional pistol. The Mauser pistol however was put together like a jigsaw puzzle, each part fit together with the others without any pin or screws. In fact the only screw on the Mauser pistol was for the grip panels.

The three brands all offered select fire versions and the primary market was for war-torn China. The select fire version is covered in Chapter 7.

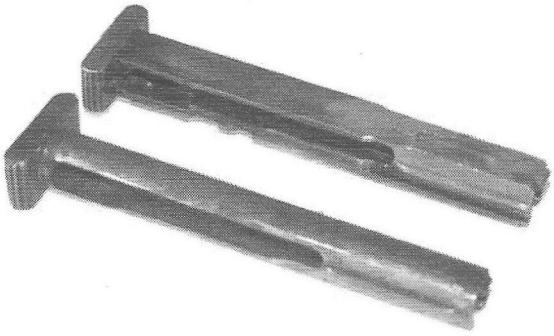
One notable feature of the Mauser pistol is that it came with a wooden holster. This holster can be attached to the pistol grip and turns the pistol into a carbine. In the US, it is illegal according to the 1934 NFA Act to have a rifle/carbine with a barrel shorter than 16 inches, but the BATF has made an exception for Mauser and Browning Hi-Power pistols for historical reasons.



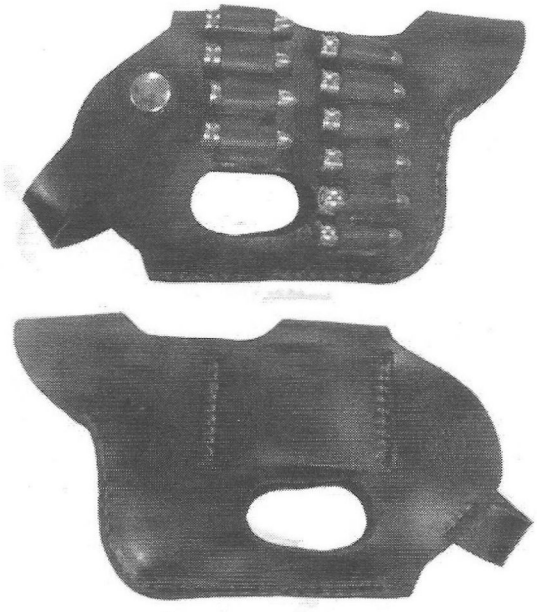
Picture 93 Royal pistol locking lug which is very different from the Mauser design.



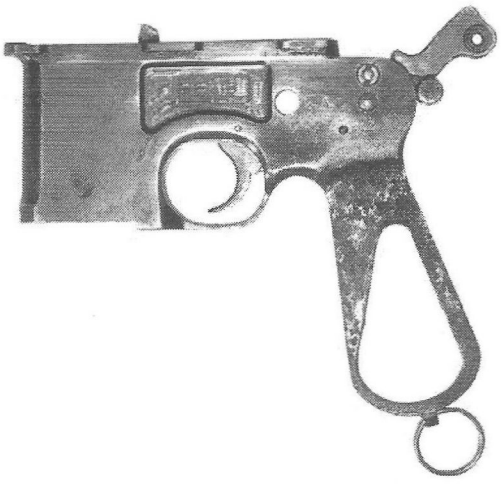
Picture 94 Locking lug comparison between the Mauser and the Astra. Even though both work on the same principle, the Astra (below) lug is pinned to the frame.



Picture 95 Royal pistol has a round bolt as compared to the square bolt of Mauser (above).

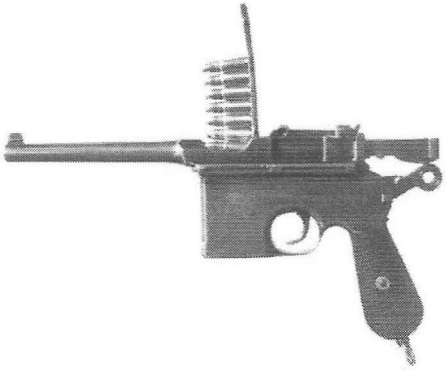


Picture 96 A skeleton C96 holster of Chinese design, the gun can be fired while it is still in the holster. Author's replica.



Picture 97 The stripped Royal frame. To take down the gun, first remove the pin in the center. Then the barrel extension can be removed by tilting it up and rearward.

The Chinese really liked the idea of having a pistol that doubled as a shoulder weapon. They added this feature to almost all the other pistols made in China, regardless of whether it was a Browning 1900, revolver or Mauser pistol. The shoulder stock certainly added stability and increased shooting accuracy. The experience this author obtained was that the bullet spread could be deceased by at least half. In addition to the accuracy, the effective range could also be extended. However, the range is still limited by the power of the cartridge. In general, it is possible to engage a target at up to 100 meters with a stocked Mauser pistol.



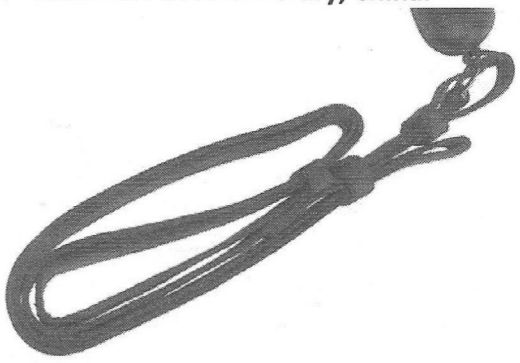
Picture 98 Loading a Mauser pistol with a 10-round stripper clip. Note this Taku pistol has the front sight machined integral with the barrel.

The Mauser pistol used the same charging system as the Mauser rifle. The 10-shot stripper clip can load 10 rounds into the magazine at once. The 7.63mm and the 9mm cartridges have the same rim size so the stripper clips are interchangeable. Without a stripper clip, the pistol is almost impossible to load. One would need to use one hand to hold the bolt back, one hand to load, and somehow secure the pistol between the legs.

Mauser pistols all came with a rear sight ranged up to either 500 to 1,000 meters. This was certainly wishful thinking. Even if a shooter could spot a target at that distance, the bullet would have lost most of its energy by the time it reached its target.

The other popular misconception in Chinese culture was that people tied a red cloth to the Mauser pistol's lanyard ring. The reality was that only bandits might do things like that. The military used a leather lanyard to secure the pistol so it wouldn't get lost in action. The red cloth might look good but it didn't really serve any practical purpose.

Picture 99 A civilian offers water to a soldier. Note the lanyard attached to the Mauser pistol on the lower left. From the 2nd Historical Record Library, China.



Picture 100 A typical lanyard of the period. One end would be put around the neck. (Reproduction)

Picture 101 A Taku produced flat side Mauser pistol.

Why were the Mauser pistols so popular in China? This author will try to examine this subject from several different perspectives.

The Mauser pistol is a large pistol. It certainly gives quite an impression of its power by the sheer size. It was not common knowledge at the time about stopping power, muzzle velocity and terminal energy. The large pistol gave the impression of more power. And just like the name "Box Cannon" implied, it was not just a pistol!

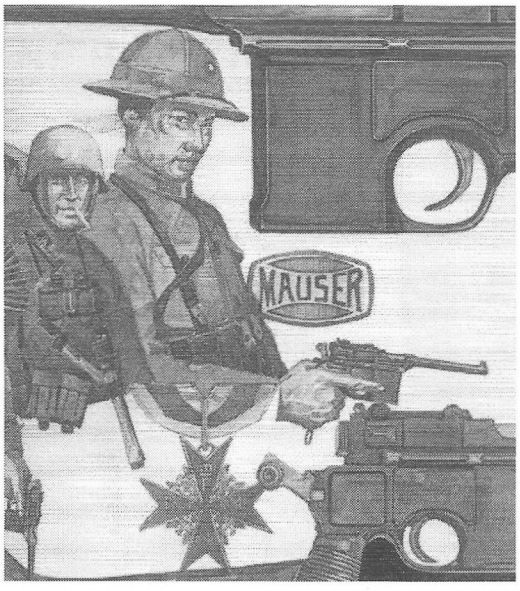
The 10 shot magazine had greater capacity than regular arms – pistol or rifle. The common sentiment was - the more the better.

The 1,000 meter rear sight must have made quite an impression as well. It implied that the gun was capable of it and that it wasn't taken advantage of was just because the shooter didn't have enough training. That range certainly was much longer than any other pistol at the time.

Lastly, also related to the size, was the wooden holster. It was pretty intimidating to onlookers.

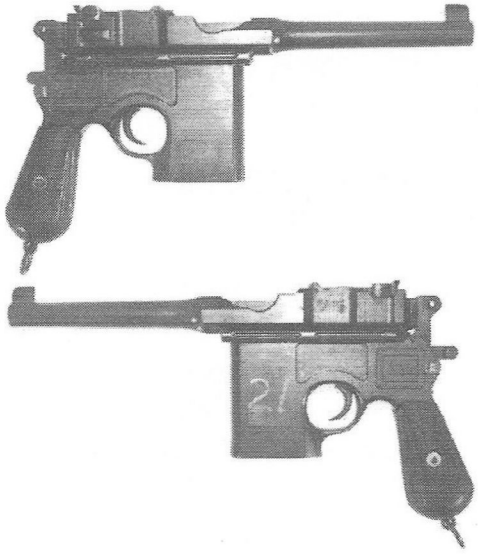
In practice, the Mauser pistol is really uncomfortable to shoot. Due to the almost completely round handle, it is difficult to get a firm grip. With the shoulder holster installed, the thumb is easily bitten by the hammer. Some suggest just putting the thumb on the right and not across the stock. The 3 fingers pull the grip back so there is a firm support from the shoulder to avoid thumb injury. Without a stripper clip, it is almost impossible to load as noted before; one would almost need to have 3 hands.

Regardless, the Mauser pistol is still firmly entrenched in modern Chinese history. From the revolution days to the 1950's, it served everywhere and was tightly interwoven with a lot of emotions about the old days, good or bad.



Picture 102 A poster printed in the US showing the Mauser C96 pistol. It also included a Chinese soldier. The 12 rayed sun was erroneously painted red. (By Kenneth Francis Dewey)

II. Shanxi .45ACP Type 17 Box Cannon



Type 17 Pistol Specifications
Operation Method: Short Recoil
O/A Length：301.2mm
Barrel Length：127mm
Caliber：45ACP/11.43x23mm
Weight：1.64kg
Muzzle Velocity：~246m/s
Feed：10-round internal magazine

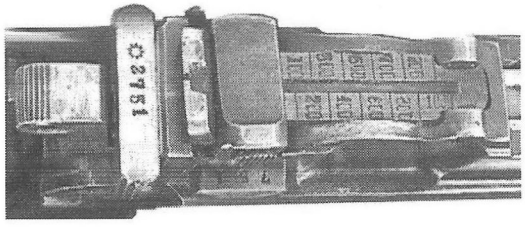
In 1928, the Shanxi Arsenal started production of a version of the Mauser pistol in 45ACP caliber. This was an attempt to standardize ammunition with the Thompson submachine guns, whose production was started in Shanxi Arsenal at the same time. It was called the Type 17 and was so engraved on the left side of the frame. The 45ACP cartridge certainly improved stopping power greatly over that of the 7.63mm. However, it would also generate much greater recoil for the shooters. The idea to standardize on 45ACP in Shanxi while everyone else in China was using 7.63mm is very interesting all by itself. Another example was that of the Shanxi adopted narrow gauge track while the rest of China used standard width track.

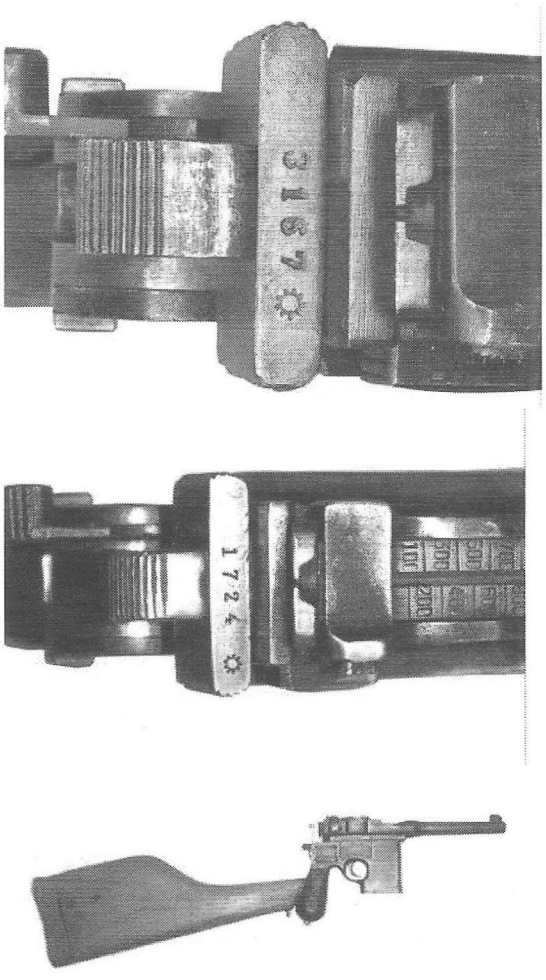
The design was identical to the Mauser pistol but scaled up to support the more powerful 45ACP cartridge. This was the only example in the world and it is very popular today with collectors.

In the 80's, China made a new batch of these pistols for export to the US. The manufacturing dates engraved on the right side were still all 1929. The price for an original and a recent copy certainly differ dramatically. Also, since it's a new production pistol, it doesn't meet the C&R status requirement. It is illegal if one was sold as such.

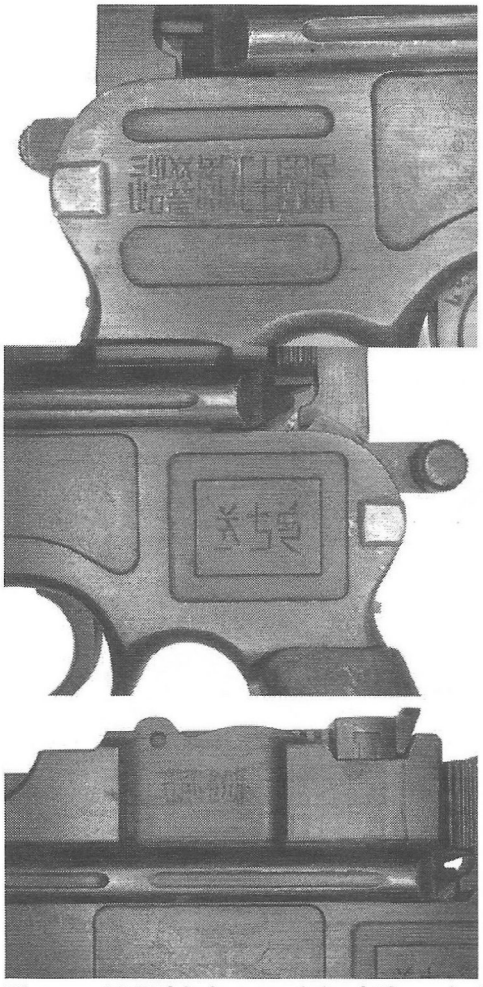
When collecting these, the first thing to note is certainly to avoid one marked with a date of 1929 (Republican year 18). Secondly, purchase the gun from a reputable source and check the C&R status of the gun.

There are also other details. The originals all have the 12-rayed sunburst on the base of the bolt, either on the right of the serial number or on the left.

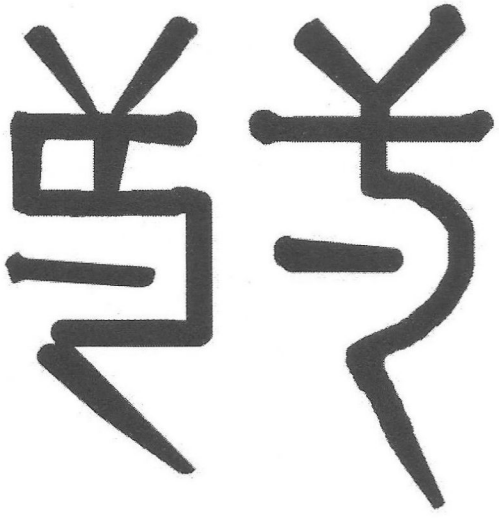




Picture 103 This is believed to be an 80's PRC imported new production gun. Robert W. Faris collection.

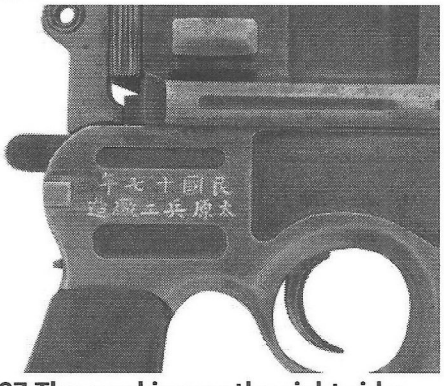


Picture 104 This is an original Shanxi pistol made in 1929. There is also a Nationalist Army property marking (國軍) on the barrel extension. Source F.

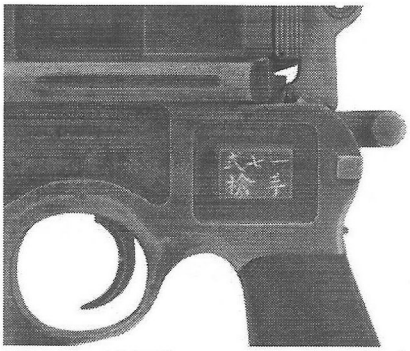


Picture 105 The "1" is written in an ancient script form. The character on the gun is on the left and the writing on the right is from the Calligraphy Dictionary, published by Commercial Press (商務印書館), Taiwan.

Picture 106 One example produced in 1928. The markings are still in plain script. Serial Number 13. Courtesy of Leonardo M. Antaris, MD.



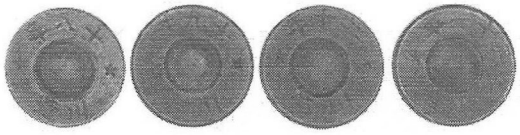
Picture 107 The marking on the right side: "the 17th Year, Taiyuan Arsenal" . Courtesy of Leonardo M. Antaris, MD.



Picture 108 The marking on the left side: "Type 17 Pistol". Courtesy of Leonardo M. Antaris, MD.

Picture 109 Another example made in 1930. Source C.

Picture 110 Compare the details. The top is an original and the two below are all from recent production. The numbers point out the variations in markings.



Picture 111 A group of 45ACP cartridges with headstamps indicating they were all made in Sichuan Province. However, there was no known 45ACP weapon in use there. On the other hand, there is no 45ACP cartridge known to collectors from Shanxi. The dates on these cartridges conveniently coincided with the time of Shanxi pistol production. Woodin Laboratory Collection.

III. Shanghai, Jinling Browning 1900 Pistols

Picture 112 An 8 inch Barrel Browning pistol made by Shanghai Arsenal. It was equipped with an adjustable rear sight and cut for a shoulder stock. Source C.

8 in Barrel Browning Pistol Specifications
Operation Method: Blow back
O/A Length：203mm
Barrel Length：142mm
Caliber：7.65x17mm (.32ACP)
Weight：0.907kg
Muzzle Velocity：318m/s
Feed：10-round box magazine

Picture 113 A 6 inch barrel Browning pistol made by Jinling Arsenal, no shoulder stock cut. Source C.

6 in Barrel Browning Pistol Specifications
O/A Length：152.4mm
Barrel Length：106mm
Weight：0.68kg
Muzzle Velocity：295m/s
Feed：7-round box magazine
Others are the same as the 8 in.

These were once very popular pistols in China. The Chinese nicknamed them "Lu Zi" (撸子), "8 Bangs" (八音子), "Gun Brand Lu Zi" (槍牌撸子). The gun brand name apparently came from the FN logo on the grip. Lu Zi was the general name for automatic pistol in the North. In the South, people called it "Bent Ruler" (曲尺) due to the similarity in appearance to a Chinese carpenter's ruler.

Browning completed this design in 1897 and was granted a patent the same year. The new cartridge was designed by Browning in conjunction with the engineers from Winchester. The targeted buyers were civilians to use for personal defense. The

Browning production in Shanghai Arsenal						
	1916	1917	1918	1919	1920	1921
6in barrel	700	1,385	1,755	2,196	60,102	303
8in barrel		100	300	640	200	1,561

operating principle was unlocked, blow back.

There was a representative from Fabrique Nationale in US at that time. He was exploring the possibility of entering bicycle manufacturing because FN had just finished the Belgium government Mauser rifle contract. He met up with Browning and the rest was history.

Browning signed a contract to authorize FN to produce the gun. In July, 1900, FN won a 20,000 pistols contract from the Belgium government. From that point on, FN enjoyed great success with the Browning design and Browning became the synonym for automatic pistol in Europe. 72,400 had been produced when this model ceased production in 1911.

Picture 114 A Shanghai arsenal produced 6 inch Browning 1900 pistol made in 1919. The serial number range matched the table shown above.

Picture 115 A generic Chinese 8 inch barrel Browning from an unknown source. There is a Qi Lin (騏驎) logo on the grip panel and some meaningless letters. Source C.

Picture 116 A female military personnel shooting a Browning 1900 pistol. Da Lu Monthly (大路月刊), issue #3.

Browning pistols were very popular in China as well. There were many copies made in various configurations. The most significant were Jinling and Shanghai Arsenal. They produced a 6 inch barrel model and an 8 inch barrel model. The 8 inch barrel model had the shoulder stock cut on the grip strap and were all considered military pistols. The

price for the 6-inch barrel model was 30 yuan and the 8 inch barrel model was 42 yuan, according to an Army Department report.

The 8-inch barrel model was also equipped with an adjustable rear sight, lanyard ring, and ventilation cuts on the lower frame surrounding the barrel. This was clearly modified for military services.

Other 1900 copies vary in quality and markings. Some had the exact markings as the FN and some markings were just a bunch of letters with no meaning. Some were probably from formal arsenals due to the fact that the polish and machine work was quite good. At that time, there were different production quotas for arsenals. They were allowed to produce additional arms on order to bring in additional revenue to support themselves. Under these circumstances, they might mark the gun according to the customers' desire.

IV. Ruby Clone by Hanyang

Ruby Pistol Specifications
Operation Method: Blow back
O/A Length：153mm
Barrel Length：85mm
Caliber：7.65x17mm (.32ACP)
Weight：875 g
Muzzle Velocity：285m/s
Feed：7-9 round box magazine

These were originally produced in Spain based on the design of Browning M1903.

During WWI, due to war time requirements, the French government contracted with Gabilondo y Urresti in Spain in 1915 to provide 10,000 guns per month. The quantity was raised to 30,000 per month soon after. The gun was called the "Ruby" pattern. The contractor didn't have the capacity itself so it subcontracted out to a dozen other manufacturers. They not only produced guns for the contract but also marketed it on their own. Therefore the existing specimens can e found with all kinds of markings and variations. There were an estimated 30 plus manufacturers that produced this type of gun. These manufacturers were mainly located in the Eibar region ofSpain.

Picture 117 A Ruby type pistol made by Beistegui Hermanos, SA, Eibar, Spain.

With the large numbers produced and cheap prices, the gun was sold all over the world. Officially, Italy also adopted the gun in addition to France. After the war, France sold 10,000 pistols to Finland in the 1920's. It was widely used in the "Winter War" and the "Continuation War" against the Soviet Union. It remained in service until the 1960's in Finland.

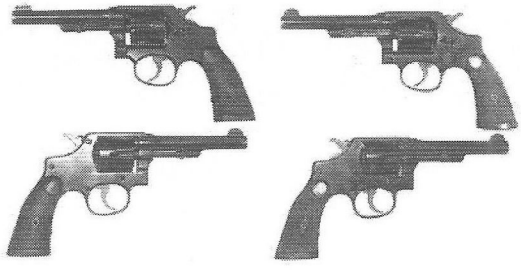
During the warlord period, all small arms were in demand in China. In addition to those imported, Hanyang Arsenal also produced a copy of this gun based on the

Astra 100 (or Astra 1915)[13]. Other smaller shops also produced some variation of this pattern.

The gun design was based on the M1903 but was greatly simplified. There is no grip safety, and the firing pin design was changed to an internal hammer. These changes were all aimed at lowering the cost and the ease of production.

Most people consider this one of the most useless pistols in history. Other than the dubious stopping power of 32ACP, the gun was heavy, inaccurate and unreliable. On top of all of its shortcomings, the quality of the guns from various sources was quite questionable. A lot of people considered that it was more dangerous behind the gun than in front of it.

V. 32 S&W Long Revolver of the 44th Arsenal



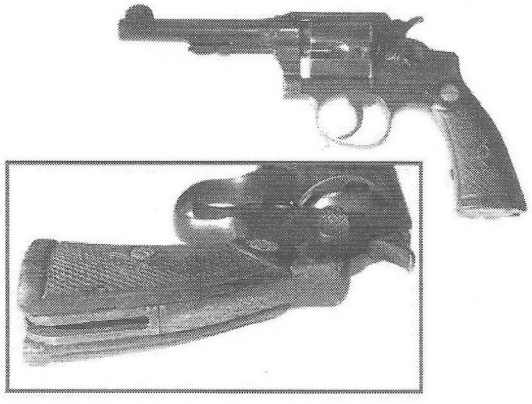
Picture 118 Two Smith & Wesson Regulation Police revolvers from various periods.

32-40 Revolver Specifications
Operation Method: Revolver
O/A Length：203mm
Barrel Length：108mm
Caliber：8x23mm (.32 S&W Long)
Weight：0.55kg
Muzzle Velocity：250m/s
Feed：6-shot revolver

The 44th Arsenal was primarily engaged with mobile ordnance repair squads. In 1941, it received an order to start small arms production in its slack time. It went to the 53rd Arsenal in 1942 to borrow around 30 gun-making machines.

In the fall, revolvers and grenades started rolling off the production line. The pistols made in the 44th Arsenal were copies of the Smith & Wesson Regulation Police, Model 31, chambered in 32 S&W Long.

Smith & Wesson is one of the oldest arms producers in US. It had started making revolvers in the 19th century and there were many different models and versions over the years. There were a variety of models in use in China with various configurations. The Chinese often milled a stock slot on the grip to use a shoulder stock. This was a customary thing in China and also showed that the pistol was not just for self-defense, but that it was considered a genuine combat weapon.



Picture 119 A S&W 32 caliber revolver. Note the shoulder stock cut on the grip (insert). Don Bell Collection.

[13] Guns, Ordnance Research Dept, The Third Field Army of Eastern China, 1952.

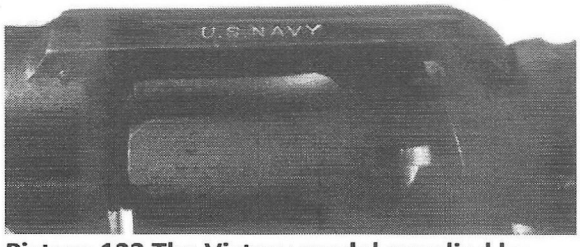
Picture 120 A 38 Special caliber S&W with shoulder stock cut. Source F.

Picture 121 Nationalist troops in their defense position in Shanghai, 1937. The 2nd person from the left is obviously an officer - he would have had to have been a captain or above to have a pistol. He is holding a revolver and is wearing a cartridge belt. The soldier on the right is armed with a Mauser pistol.

During WWII, the US continued to produce revolvers to supplement automatic pistols. The most numerous model produced was the S&W Victory model. The name came from the V prefix of its serial number. It was a simplified version of the pre-war Military & Police model. They were supplied to not only the US troops but also Allied troops. The largest quantity went to the British.

The total production was around 800,000 pistols. The Victory model was brought in by SACO to supply its Chinese troops.

Picture 122 Victory model revolvers with different barrel lengths.



Picture 123 The Victory model supplied by SACO had U. S. Navy markings.

Section 3. Imported Pistols

I. FN 1910、1922/10 Pistol

1910 Pistol Specifications
Operation Method： Blow back
O/A Length： 152mm
Barrel Length：87mm
Caliber：7.65x17mm (.32ACP)
Weight：570g
Muzzle Velocity：280m/s
Feed：7-shot box magazine

1922/10 Pistol Specifications
Operation Method： Blow back
O/A Length： 178mm
Barrel Length：133mm
Caliber：7.65x17mm (.32ACP)
Weight：680g
Muzzle Velocity：285m/s
Feed：8-shot box magazine

Picture 124 The serrated muzzle ring gave it the Chinese nickname "Floral mouth pistol" (花口撸子).

The 1910 was nicknamed "floral mouth pistol" by Chinese. It was also called "10-shot repeater." The 1910 was another successful design by Browning which followed the 1900. It also employed an unlocked, blow back action but it incorporated some advanced features and these features were widely copied. The barrel was secured to the frame. The muzzle locking mechanism and the grip safety were later seen on many other pistols.

Picture 125 FN 1910/22 pistol.

The 1922 was a larger version of the 1910. It was also called the 1910/22. It was developed based on the requirement of the Yugoslavian Army in 1922. It is a 1910 with lengthened barrel and a larger frame to suit military services. Browning also made changes to the muzzle locking mechanism to simplify the take-down of the pistol. It

was also widely used by military forces around the world.

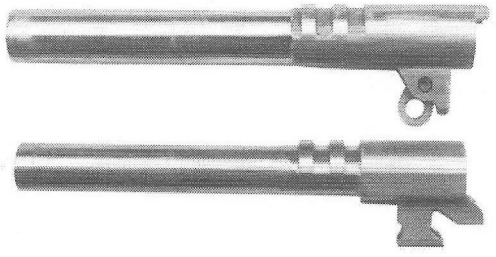
Picture 126 FN 1910 and FN 1910/22 side by side comparison.

II. FN & Inglis Browning Hi-Power Pistol

Browning Hi-Power Pistol Specifications

Operation Method： Short Recoil
O/A Length：197mm
Barrel Length：120mm
Caliber：9x19mm(9mm Parabellum)
Weight：1,000g
Muzzle Velocity：350m/s
Feed：13-shot box magazine

This was Browning's last design, which was assisted by Dieudonne Joseph Saive from FN. The design was completed in 1929 but the great depression delayed its production and it was not formally introduced until 1935. Many experts consider this the perfect pistol design. The operating system was widely copied and it is still in use by most of the large pistol makers in the 21st century.



Picture 2 The comparison of the barrel locking mechanisms between the 1911(above) and the Hi-Power.

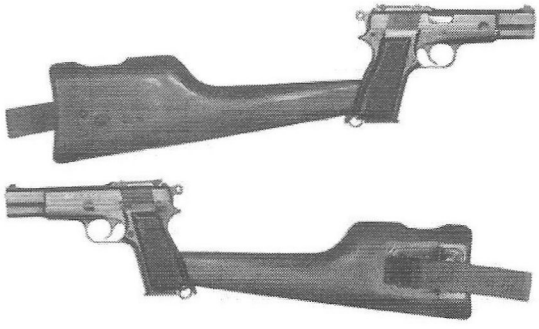
The Hi-Power pistol evolved from the 1911. The most notable improvement was that the locking link was modified to a locking cam. The operating principle is still short recoil. The barrel recoils with the slide a short distance after the shot is fired. The barrel stops and cams out of the slide. The slide continues its rearward movement, ejecting the shell and compressing the main spring. The main spring then returns the slide to battery with a fresh round.

A notable feature of Hi-Power was that the magazine held 13 rounds. It almost doubled the magazine capacity of other period pistols.

The Chinese imported a certain number of Hi-Power pistols before the war. In 1941, the representatives of China Defense and Supply Inc. visited John Inglis Company in Canada. The representatives requested John Inglis Company to supply China with light machine guns and also possibly Hi-Power pistols.

Picture 127 The original Belgium FN made Hi-Power and stock. Valentine H. Christmann collection.

Picture 128 The original Belgium FN gun slide marking. Valentine H. Christmann collection.



Picture 129 The Canadian John Inglis made Hi-Power with shoulder stock. The stock was made at China's request.

John Inglis Company had never produced pistols before but was willing to try. Several attempts to acquire engineering drawing from Belgium and evacuated FN officials in London failed to produce any results. John Inglis Company started the reversed engineering process with 6 Belgium Hi-Power pistols provided by Chinese delegates in Washington D.C. in 1943. The original plan was to procure 180,000 pistols for China. The number that arrived in Karachi, India, was only 4,000 before the end of the war. It is unknown how many of the 4,000 actually arrived in China during the war. The main difficulty was that there was no effective way to transport aid materials into China other than by air lift over the "Hump." The Canadian authorities canceled the project. The pistols intended for China all had CH in the serial numbers. The remaining pistols from the program were diverted to Britain, Austria, Canada and other commonwealth nations. It became impossible to later tell where a pistol had been originally shipped.

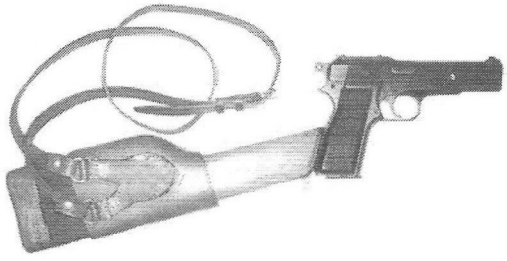
The original design included the "Property of Republic of China" (中華民國國有) marking in Chinese on the slide. It was later deleted but some pistols were marked in China. Many of them didn't have this marking but were marked "Gong Qiang" (公槍) (Public Service Gun). This marking was applied by the Communist regime after 1949 and the pistols were probably issued to police. Many of these pistols were imported from China in the 80's.

After the war, the program resumed somewhat. There were two batches shipped to China in 1945. A total of 39,760 pistols were shipped to Shanghai for delivery.

Afterwards, Canada was persuaded by Britain to stop all war materials shipments to China in light of the brewing civil war in China.

The total number shipped to China was 43,760.[14] Of these about 28,000 were shipped with wood stocks, as requested by the Chinese Army. The wood stock was similar to the Mauser shoulder stock but wider and shorter. Later, China produced a copy domestically but the Chinese produced stocks were slimmer and longer, as depicted in the picture below.

Chinese being not very precise on the model designation, there was no formal designation but it was generally referred to as "Jia 90 Pistol" or "Jia Qu Chi Pistol". The former means Jia - short for Canada and 90 is the caliber. The latter means that it is a Canadian pistol resembled a bent ruler of a wood carpenter.



Picture 130 The Canadian John Inglis made Hi-Power with a Chinese made shoulder stock.

As an historical side note, the Browning was probably the only pistol used on both sides during WWII. The Axis had the FN version and the Allies had the John Inglis version.

III. Canadian 9x19mm Cartridges

Picture 131 9mm rounds provided to China during the war by Canada. The date stamps range from 1940 to 1945.

Canada also supplied a certain amount of 9mm cartridges to China. Records show that there were 25,600,000 cartridges shipped in the first half of 1945. How many actually made it into China via the Hump is another question.

The date stamps appear to be between 1940 and 1945. However, there were not that many weapons in China that were in 9mm caliber, so usage would be limited.

Some collectors note that the CIA made batches of 9mm cartridges with the same kind of head stamps in the 1950's. These were supplied to various organizations in Caribbean countries for anti-Communist operations. The cartridges that exist today were actually from those CIA made batches.

Regardless, the Nationalist Government received Browning pistols and some Canadian STEN submachine guns towards the end of the war. Before that, the 9mm was not a very popular round in China.

[14] Inglis Diamond, p. 234, Clive M. Law, Collector Grade Publications, 2001.

IV. Spanish Astra 1921 (M400) Pistol

Astra 1921 Pistol Specifications
Operation Method： Blow back
O/A Length： 222mm
Barrel Length：140mm
Caliber：9x23mm Largo (9mm Bergman-Bayard)
Weight：907g
Muzzle Velocity：544m/s
Feed：8-shot box magazine

The Astra M400 was one of the few exceptions in military handguns that was a full size military gun but employed an unlocked, blow-back design. Astra was the trade name for Esperanza y Unceta. The Spanish Army adopted the M400 in 1921 and it remained in service until 1946.

The Astra M400 or its commercial version, the 1921, wasn't a small gun. It was a full size pistol and certainly good enough for military service. It was extensively used by both sides in the Spanish Civil War as well as exported all over the world.

The pistol clearly was heavily influenced by the Browning 1910 design. The barrel is affixed to the frame, the powerful main spring wraps around the barrel and due to the required strength of the spring, it was sometimes difficult to draw the slide back. This type of design needed to have a way to seal the muzzle between the frame and barrel. In taking down the gun, the seal ring needs to be taken out first. Typically it needs to be depressed a little and rotated out of engagement while it is still under spring pressure. It is important to point the muzzle towards a safe, solid backdrop for the ring often flies out with the spring.

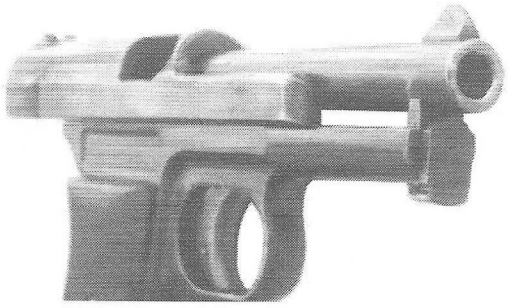
The trigger is also a Browning type single action. There were other unique features in this pistol. There is a hold open device when the last round is fired but there is no release mechanism. So even when a fresh magazine is inserted, the slide needs to be pulled back a bit and then released to close the breech. The magazine does not drop out when released. There is a magazine disconnector and the pistol cannot fire when there is no magazine in the gun. There is also an external safety lever.

The 9x23mm cartridge is a very old cartridge. It was the standard round for Spain for many years and somewhat popular in Europe but its availability in other places was minimal. The people issued this pistol in China must have had a hard time trying to find ammunition.

V. German Mauser 1910, 1914, and 1934 Pistols

Mauser 1914 Pistol Specifications
Operation Method： Blow back
O/A Length：155mm
Barrel Length：85mm
Caliber：7.65x17mm (.32ACP)/ 6.35x16mm (.25ACP)
Weight：0.62kg
Muzzle Velocity：348m/s
Feed：8-shot box magazine

This pistol was nicknamed "Kick Mouth Open" (張嘴蹬) by the Chinese. The name came from the hold open feather when the gun is empty. It was as if the gun opens its "mouth" and was waiting for something. Later it evolved into another word meaning "Kick." The most notable feature is that regardless of whether the magazine is loaded or not, the slide will fly forward when a new magazine is inserted.



Picture 132 Waiting with an open "mouth".

This was formally offered by Mauser in 1910 to compete in the new, hot, automatic pocket pistol market. The original caliber was 6.35mm and Mauser upgraded it in 1914 to 7.65mm. The basic design remained the same. This was never officially adopted by German authorities and was considered a pocket pistol for self-defense . However, a lot of German officers purchased this pistol on their own and it saw extensive military service in WWI and beyond.

The design itself didn't break any new ground. The internal firing pin and fixed barrel could be seen in other Browning pistols. However, it was made with typical Mauser quality and attention to details. It's a fine pistol with very high reliability.

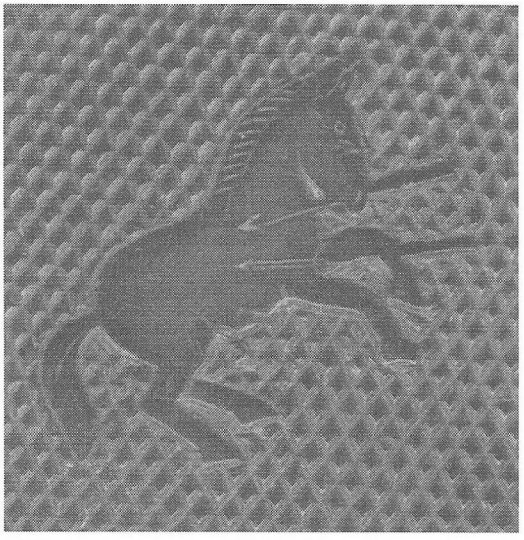
VI. US Colt 1903 Pistol

Colt 1903 Pistol Specifications
Operation Method： Blow back
O/A Length：172mm
Barrel Length：95.3mm
Caliber：7.65x17mm (.32ACP)/ 9x17mm (380ACP)
Weight：680 g
Muzzle Velocity：289m/s
Feed：8-shot box magazine

This is one of the earliest Colt manufactured automatic pistols. The Chinese called it the "Horse Brand Pistol" (馬牌撸子), which clearly came from the rampant colt logo on the pistol grips.

After the 1900 entered production, Browning came up with a vastly improved new design in 1901. Colt was seeking an automatic pistol design to compete in the market and possibly as a replacement for its revolvers. Colt accepted the Browning design and put it into production.

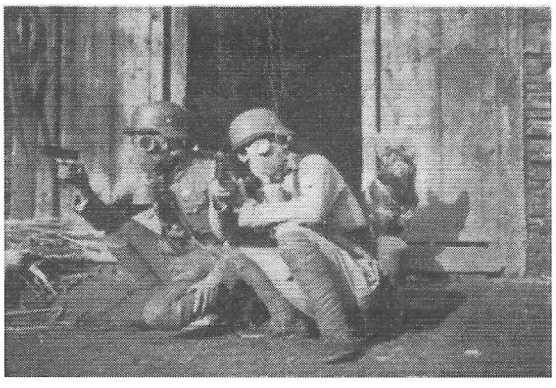
The 1903 pistol was a yardstick for modern automatic pistols. The design features on this pistol would be imitated, copied and measured against for years to come. These features included the two safeties – manual and grip-, having the main spring under the barrel and barrel fixed to the frame.



Picture 133 The Colt logo on the grips.

The 1903 had a very rounded surface- there were no protruding edges to catch on clothing; it was an ideal carry gun. The 1908 version was chambered in 9x17mm (380ACP) and was issued to US Army officers in limited quantity. The majority of the 1903 pistols were sold through commercial channels and it was also popular with police forces all over the world.

The same design was also produced by FN and Sweden.



Picture 134 Chinese Troops in Shanghai in 1937. It appears that the soldier on the left

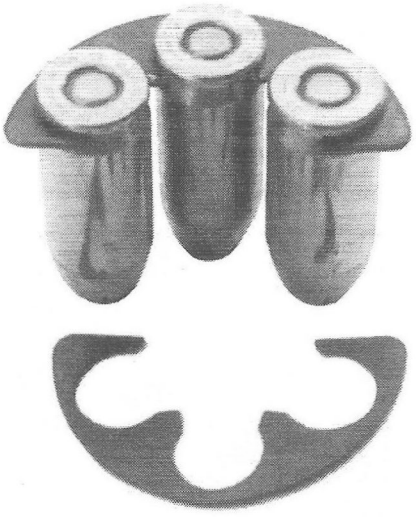
has a Colt 1903 type pistol. Courtesy of Fuguohui (複國會).

VII. US Colt 1917 Revolver

Picture 135 A US Colt 1917 revolver. Charles Kramer Collection.

Colt 1917 Revolver Specifications
Operation Method： Revolver
O/A Length：274.3mm
Barrel Length：139.7mm
Caliber：11.43x23mm (45ACP)
Weight：1.14kg
Muzzle Velocity：210.8m/s
Feed：6-round revolver

The Model 1917 was adopted during WWI by the US Army to supplement the 1911 automatic pistol. The Army contracted with Colt to produce the "New Service" model revolver and adopted it as "Colt New Service, US Army Model 1917." More than 500,000 were produced during WWI. Smith & Wesson also produced a similar revolver. The difference in appearance could be readily seen by the presence of an ejector protection shroud on the Smith & Wesson model which the Colt didn't have.



Picture 136 Half moon clip (below) and half moon clip loaded with 45ACP cartridges.

Even though it was a revolver, the 45ACP cartridge was chosen to simplify ammo supply. The 45ACP doesn't have a rim, so the designer not only had to resolve the cartridge seating depth problem but also had to address the problem shell ejection. The so called "half moon clip" was developed to address the ejection problem. It held three rounds of 45ACP together and loaded and ejected along with the cartridges. The half moon clip was thin with many angles. It must not have been very friendly to the fingers when the user was under stress in a combat situation.

After WWI, the 1917's were put into storage. When the US entered the WWII, they were taken out of storage and pressed into service again. The majority of them went to 2nd line troops and allies. The 1917's were also supplied by SACO to its units in China.

VIII. US 1911/1911A1 Pistol

Picture 137 US 1911A1 manufactured by Remington-Rand.

Colt 1911 Pistol Specifications
Operation Method： Short recoil
O/A Length：218.26mm
Barrel Length：128mm
Caliber：11.43x23mm (45ACP)
Weight：1.10kg
Muzzle Velocity：247m/s
Feed：7-round box magazine

The 1911 pistol is one of the most famous pistols in the world. The US adopted it prior to WWI and it remained standard issue throughout all the conflicts the US participated in, all the way up to the 1980's. US forces were deployed all over the world and the 1911 accompanied them everywhere. It is rare for any other firearm to have such a proliferation.

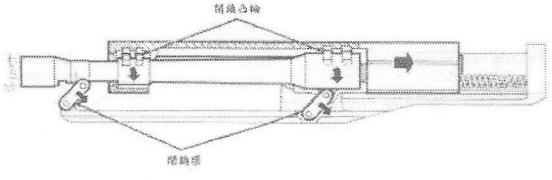
The history of the 1911 started with the US Army pistol trials in 1906. The trial concluded in March, 1911. The Colt manufactured Browning design won the trial after firing 6,000 rounds without any failure. It was adopted as "U.S. Pistol, Caliber .45, Model of 1911."

The 1911 is recoil operated. The barrel and slide are locked together via several serrations on top of the chamber end of the barrel., When the pistol is fired, the slide and barrel recoil together a short distance and then the barrel is cammed out of the slide by the inclined locking link and stops. The slide continues its travel to complete the rest of the cycle.

The 1911 changed very little over its service life. Some cosmetic and usability issues were addressed in 1926 and the designation was changed to 1911A1 which then soldiered on into the 1980's.

1911's were the primary sidearm for US troops in WWII. There were several manufacturers producing them including Ithaca, Remington Rand, Union Switch & Signal, and Colt. Total production was 1.8 million pistols during the war. It was supplied to allied nations as well. China received 1911's from SACO in the early part of the war, for the X-Force in India and from the OSS for commandos in the final days of WWII.

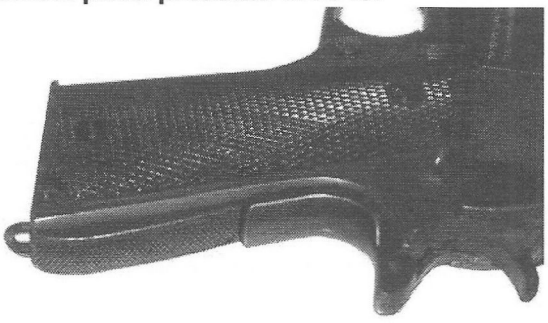
The Chinese called it "Big Eye Pistol" (大眼撸子) due to the large caliber. In southern China, it was referred to as "Bent Ruler Pistol" (曲尺手槍).



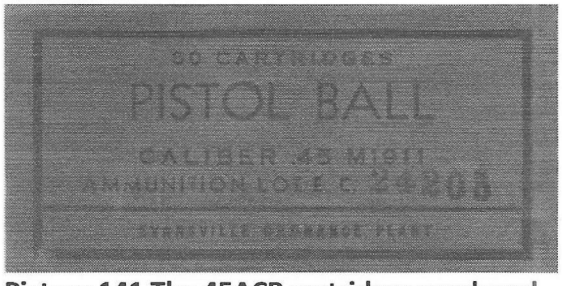
Picture 138 The original design of the 1911 with two locking links. The front link and lug were later deleted.[15]

[15] Reference 13, Vol VI, p. 330

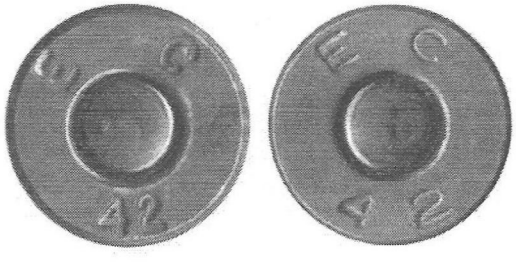
Picture 139 Marking of a Remington-Rand 1911A1 pistol produced in 1943.



Picture 140 The backstrap housing of the Remington-Rand 1911A1 pistol was originally cross-hatched. Later, it was changed to vertical lines.



Picture 141 The 45ACP cartridges produced by the Evansville Ordnance Plant in 1942.



Picture 142 Headstamps of the Evansville 45ACP cartridges.

Picture 143 US 1911pistol manufactured by Colt. Note that there are no crescent-shaped cuts behind the trigger, a straight main housing, and a short beaver-tail grip safety. Charles Kramer Collection.

IX. US Savage 1907/1917

Savage 1907/1917 Pistol Specifications

Operation Method： Short recoil
O/A Length：167mm
Barrel Length：92mm
Caliber：7.65x17mm (32ACP)
Weight： 600 g
Muzzle Velocity：285m/s
Feed：10-round box magazine

Picture 3 The Indian Chief logo on the Savage pistol grip.

The Chinese nicknamed this "Savage" (野人牌). Although that is the same as the company name, it is believed that the name came from the Indian Chief logo on the grip. The logo came from a deal between Savage and an Indian chief named "Lame Bear." He authorized Savage to use his image in exchange for getting a discount on Savage arms.

The Savage 1907 was designed by Elbert H. Searle and the patent was granted in 1905. It utilized a rotating barrel lock system. The pistol was originally manufactured in 45ACP to compete in the US Army pistol trials. It was one the finalists but eventually lost out to the Colt 1911. After the trials, Savage focused on the commercial market, offering it in 32ACP and 380ACP calibers. Production ceased in 1928.

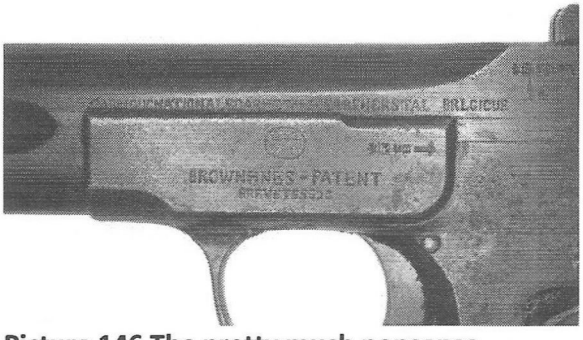
There have been several variations produced since 1908 with a similar outward appearance, such as a hammerless version. The pistol didn't use any screws, was very easy to disassemble, and aiming is very natural. It was a very advanced design for its time and the reason it wasn't more successful may be due to its manufacturer's lack of marketing muscle.

Picture 144 The slide, breech block and barrel of the Savage 1907. It uses a rotating mechanism to unlock the pistol. Te barrel rotates about 7 degrees after discharge to delay breech opening.

Section 4. Other Domestically Produced Pistols

As mentioned above, there were arms produced in small shops or by traveling gun squads in China even before the war. Other than copying famous pistols along with their markings, some were unique designs by their makers or very different from any other known pistol. Some of them might have resulted from the maker putting together whatever parts were on-hand but there were some instances which seem to be original designs.

Picture 145 An scaled up Browning 1900. Its over all length is 20.3cm vs the 16.5 of the original. Source G.



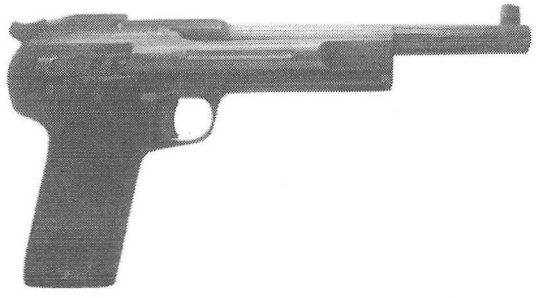
Picture 146 The pretty much nonsense marking of the above gun. Source G.

Picture 147 Another 1911 with "Made in US" marking on the trigger. Source C.

Picture 148 An unknown pattern pistol, it has features of Browning, Ruby and Mauser. Source F.

Picture 149 The markings on the above gun. It has both Mauser & FN logo. Source F.

Picture 150 Unknown Chinese pistol 1. Source C.



Picture 151 Unknown Chinese pistol 2. Source C.

Picture 152 Unknown Chinese pistol 3. This, might be a clone based on the French Ruby. Source C.

Picture 153 Unknown Chinese Pistol 4. Source C.

Picture 154 Unknown Chinese Pistol 5. Source C.

Picture 155 A Browning 6-inch barrel pistol copy. It has all the markings except the serial number, which were all the same.

Section 5. Captured Japanese Pistols

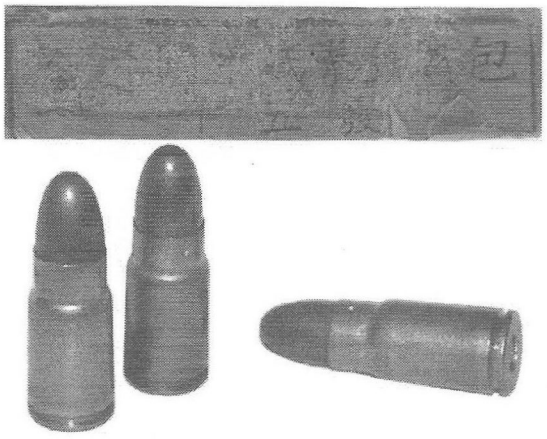
I. Japanese Nambu Pistol

Picture 156 Early pattern (top) and late pattern Nambu pistols.

Nambu Type 14 Pistol Specifications
Operation Method： Short Recoil
O/A Length：230mm
Barrel Length：114.3mm
Caliber：8x22mm
Weight：890g
Muzzle Velocity：290m/s
Feed：8-round box magazine

The Taisho 14 pistol was designed by the Japanese designer Kijiro Nambu while he was working for the Tokyo Artillery Arsenal. There are four variations: - the Nambu (1903), Baby Nambu, Taisho 4 Nambu and Taisho 14 Nambu. The first three all had grip safeties. The Baby and Taisho 4 came with shoulder stock slots. The Type 14 was modified for ease of production as requested by the Army in 1925 for general issue and was adopted as the standard Japanese Army side arm. The total production was 280,000 pistols.

Even though the appearance resembles a German Luger, the internal design is quite different. It used the unique 8x22mm cartridge which had fairly modest power.



Picture 157 Type 14 pistol cartridges, 15 per box.

There were several modifications after the gun entered series production. The magazine safety was added in 1934. The enlarged trigger guard was added in 1939, so that it could be fired with gloves on, supposedly because of experiences learned in Manchuria. (It was also called the Northern Manchuria model.) Later on, due to the tendency of the magazine falling out the gun during firing, a spring was added to the front of the grip to help secure the magazine.

The Nambu was a strange looking gun with very modest power. The muzzle velocity was only 290m/s with an energy level of 274 joules. In terms of power, there is no comparison between the Nambu and Mauser pistols. It was said that even the Chinese Communist guerrillas behind enemy lines looked down on Nambus during the war. Nambu admitted in his memoir that "There is nothing worth mentioning about this pistol."

The holster has a large bulged portion and this gave it the nickname "Turtle shell pistol"(王八盒子). Another name came from the shape of the handle –"Chicken thigh pistol" (雞腿撸子).

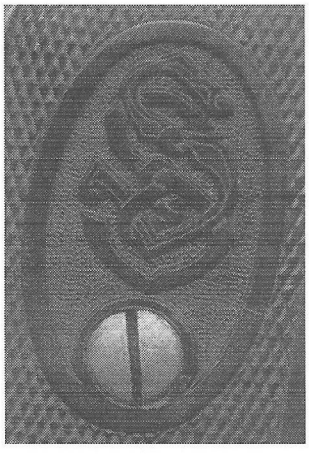
Nationalist troops and guerrillas certainly captured quite a few of this model pistol

but due to the unique cartridges it used; it must have been difficult to find supplies of ammunition.

Section 6. The Combat Experience and Comments

Other than standard side arms issued by the military, pistols were also popular with guerrillas, intelligence operatives and anyone needing to conceal a weapon. The models deployed in China during the war were so diverse that they came from all countries and included all models.

In addition to the above mentioned pistols, there are also:
Homemade, single shot black powder or cartridge pistols called "Jue Ba Zi" (撅把子). They usually employed a break open action, and were single shot only.



Picture 158 J.P. Sauer & Sohn, 1913. Due to the intertwined SS lettering on the grip, it's was nicknamed "Snake Brand."

Picture 159 German Sauer & Sohn 1913 pistol.

Mauser pistols were widely deployed with Chinese troops. With the shoulder stock, it was possible to engage a target at 100 meters or even more. However, the 7.63 caliber cartridge with a 5.57 gram bullet carries limited energy. Even though many popular stories exaggerated the usage of Mauser pistols, it is not realistic to consider the Mauser pistol as a main battle weapon.

Another problem with the 7.63mm bullet was over penetration. According to a US Army test, the bullet can penetrate 70 inches of simulated human body tissue without any deformation or yaw. This clearly reflects that it didn't have enough stopping power. The same thing was true of the Japanese 6.5mm cartridge. Some veterans commented that "unless vital organs were hit, the 6.5mm bullet would just drill a hole in the body and it's not a big deal." This is not to say that it can't kill. Stopping power means that a bullet can stop an enemy instantly. With an enemy soldier charging, if the shots fired can't stop

him in his tracks, then most likely he will do some harm to the shooter.

The 7.65x17mm (32ACP) was also popular among officers. The guns using this cartridge were mostly considered pocket pistols. This cartridge is even less powerful than the 7.63. Especially in colder climate regions, it is doubtful that it could even penetrate a thick cotton coat. The popular 9mm wasn't a main cartridge used in China.

There were also large quantities of various types of revolver in service during the war. In general, pistols were status symbols for officers. A pistol has dubious combat value but it is certainly good enough to scare peasant conscripts sufficiently to follow orders.

月刊画報合綵
大路
第三號

Chapter 4. Rifles

"China currently has 182 Infantry Divisions, 46 Independent Infantry Brigades, 9 Cavalry Divisions and 6 Independent Cavalry Brigades, 4 Artillery Brigades, and 20 Independent Artillery Regiments. There are other special units and local units not included. The training and equipment varies a lot between units but unfortunately it is not up to our expectations in general. The combat strength also varies.

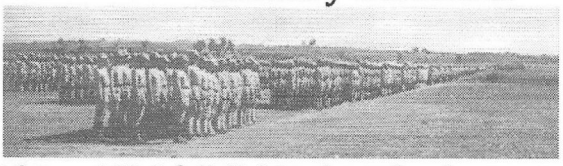
There are other current troop TO&E in existence, other than those of the Sichuan, Yunan, Guangdong, Guangxi, Shenxi, Suiyuan (綏) and the Northeastern Army types. There are also the 19th Year Division type, 21st Year Army Division type, 22nd Year Bandit Pacification type, 24th Year Model Division type, Consolidation type and 25th Year Adjusted type. In light of the modern combat requirement and equipment availability, the plan is to organize all troops into Type A and Type B:

(A) Type is proposed to be based on the 25th Year Adjusted type. All the re-organized divisions will be organized according to this type. It is equivalent to the Regular Army Division of other nations.

(B) Type is proposed to adopt the 24th Year Consolidation type. It is similar to the Reserve Division of other nations."

He Ying Qin, February 1937, Military Report in the 5th Conference of the 3rd Central Committee, the Nationalist Party

Section 1. The Small Arms in Chinese Infantry Divisions



Picture 160 A full division in review in eastern Zhejiang Province during the war.

The 21st Year Army Division had a very large organization chart. The small arms totaled over 12,000 pieces. With the additional special units, the total personnel would exceed this number. The 24th Year Model Division was similar to the 21st Year Army Division and the 24th Year Consolidation type shifted the machine gun company to the regiment level, the mortar platoon was expanded into a company size and moved under the regiment. The 25th Year Consolidation type basically evolved from the 21st Year Army Division type, with some elements of the 24th Year Model Division mixed in. In reality, when the war broke out, there was not enough time nor equipment to have a large scale re-organization. Even though most of the small arms could be supplied domestically, 20mm and larger caliber guns were scarce. The primary TO&E in the war was the 26th Year type as stated by Chen Cheng (陳誠).

The 26th Year Type Division TO&E[16]	
Personnel	10,923
Rifles, Carbines & Pistols	3,821
Grenade Dischargers	243
LMG's	274
HMG's	54
Artillery/Field Pieces	16
Regimental/Battalion Artillery Pieces	30

In this TO&E, there were three squads in a platoon, three platoons in a company, and three infantry companies, one mortar platoon and one machine gun company in a battalion. Ideally, each infantry squad would have 14 soldiers armed with 12 rifles and one LMG.

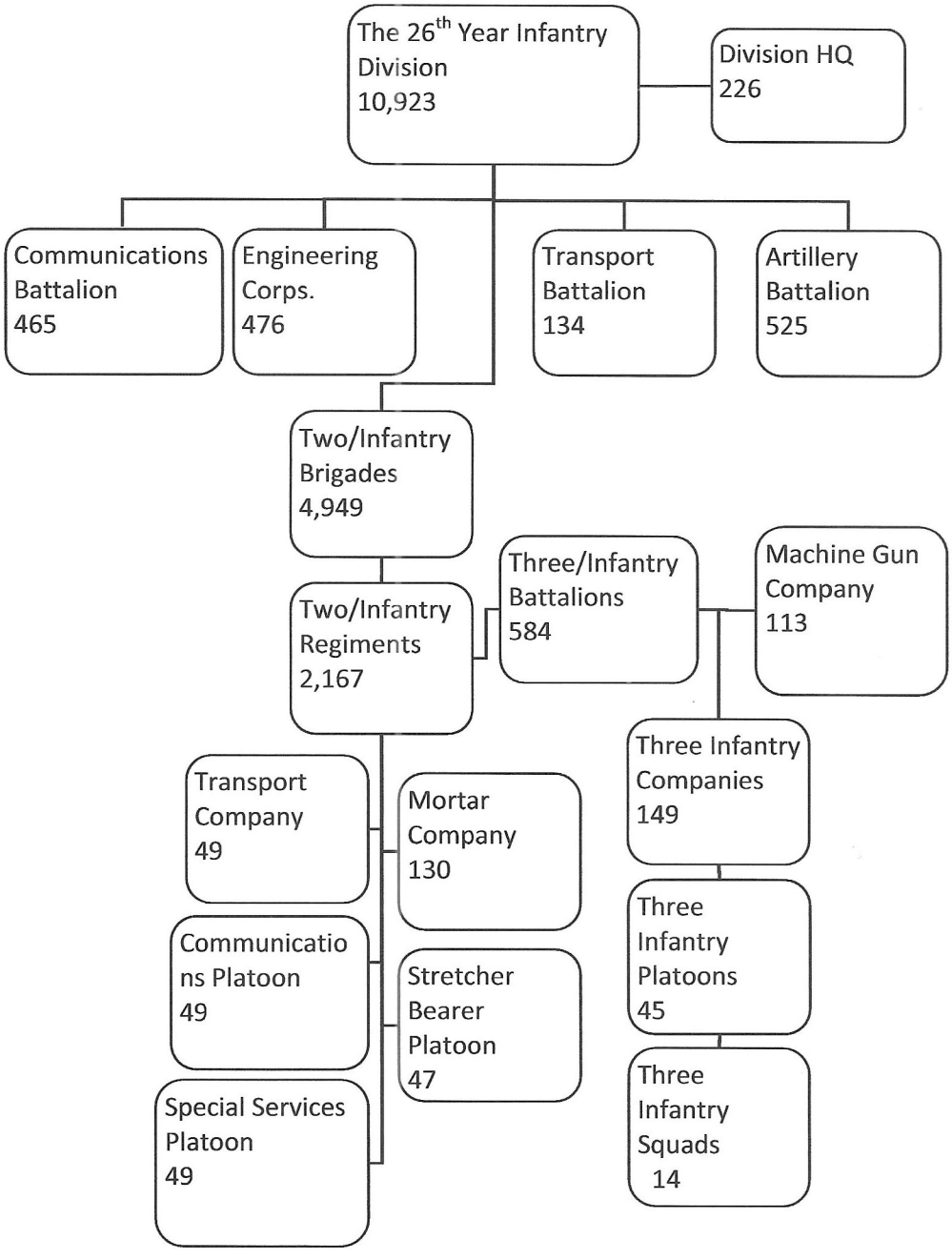
Rifles, carbines, pistols, grenade dischargers and sub-machine guns were considered personal weapons, light machine guns were platoon and company level automatic weapons, and heavy machine guns were battalion and regiment level, crew-served automatic weapons. Heavy machine guns were assigned to an infantry company or battalion at the time of deployment. They were assigned as a platoon (two guns). The assignment of infantry guns, mortars, howitzers and mountain/field guns depended on the combat situation and didn't have any quick and fast rules.

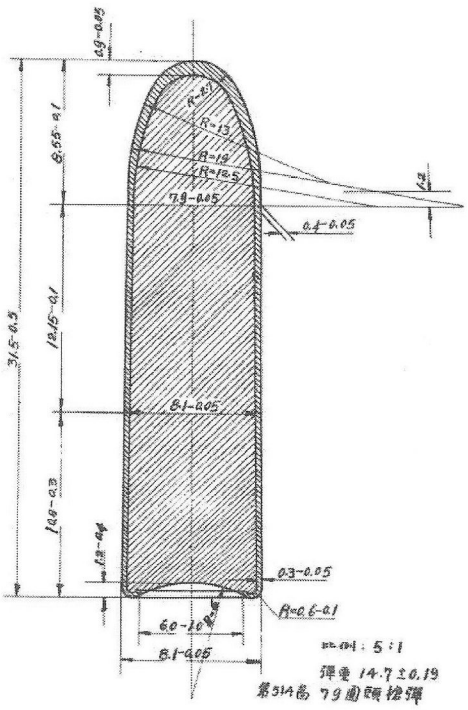
The warlords inherited quite a few types of weapons from the previous Qing regime and the procurement of new arms also followed the pattern of the old days - each province acquired what they wanted and took what they could get. This created complete chaos in types of arms, calibers and weapon systems. Some said the arms situation in China was the delight of collectors but the worst nightmare of a supply officer. The situation improved greatly during the war due to the cut-off of arms sources from abroad as well as much better central government control.

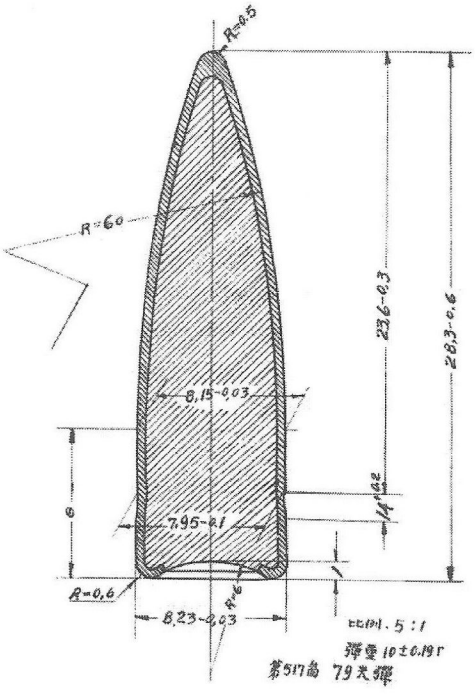
[16] Summary of the Eight Years War of Resistance, Chen Cheng, Chief of General Staff, 1946.

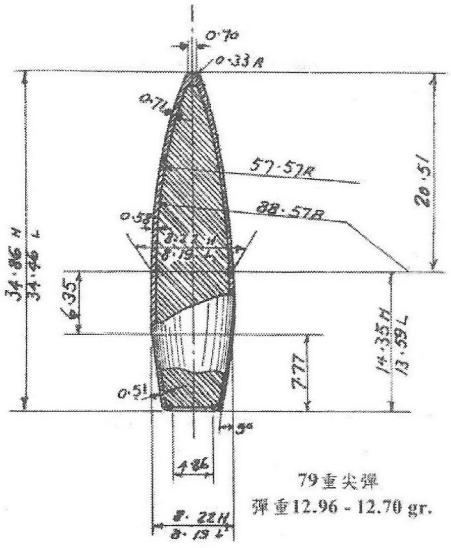
The TO&E of the 21st Year Type Division[17]								
		Rifles	**Carbines**	**Mauser Pistols**	**Pistols**	**LMG's**	**HMG's**	**Note**
Division HQ				54	21			
1st Brigade	Brigade HQ			15	5			
	1st Regiment	1,387	79	393	12	56	18	
	2nd Regiment	1,387	79	393	12	56	18	
	Special Services Platoon	42		3		2		
2nd Brigade		2,816	158	804	29	114	36	
Cavalry Company			169	29			2	
Reserve Regiment		1,387	79	393	12	56	18	
Artillery Regiment		42	698	539	10	2		Mountain Gun Regiment: 806 Carbines
Engineer Battalion		440		98	1			
Communications Battalion		149		104	2			
Transportation Battalion			132	68	1			
Medical Team				23	3			
Special Services Company		170		15		8		
AA Lighting Platoon		11		17				
Total		7,831	1,394	2,948	108	294	92	The original Chart listed: 2,940 Mauser Pistols, 1,395 Carbines

[17] Liu Feng Han, The Army Re-Organization Prior to the War, The 10-Year Nation Building History Conference Essay 1928-193, Taipei, Academia Sinica, Institute of Modern History, Dec. 1984


The 26th Year Infantry Division
10,923
Division HQ
226
Communications Battalion
465
Engineering Corps.
476
Transport Battalion
134
Artillery Battalion
525
Two/Infantry Brigades
4,949
Three/Infantry Battalions
584
Machine Gun Company
113
Two/Infantry Regiments
2,167
Three Infantry Companies
149
Transport Company
49
Mortar Company
130
Communications Platoon
49
Stretcher Bearer Platoon
47
Three Infantry Platoons
45
Special Services Platoon
49
Three Infantry Squads
14







Picture 161 The three types of 7.9mm bullets China produced during the war. The round nose bullet weighed 14.7 g (226.8 grains), the spitzer bullet weighed 10 g (154.3 grains) and the heavy spitzer bullet weighed 12.96 g (200 grains). Reference 32.

I. The Chinese Army Battalion Organization

A Chinese infantry division was small compared to a Japanese division. A Chinese division usually consisted of two to four regiments. It used to have a brigade HQ above the regiment but this was abolished in 1938. A regiment had three infantry battalions, a battalion had three infantry companies and an infantry company had three infantry platoons. Each platoon had three infantry squads and each squad consisted of 10 to 14 soldiers. Most of the soldiers were armed with rifles, except for cooks, administrative staff and machine gunners. The soldiers in the cavalry and artillery units were armed with carbines.

The Army re-organization effort prior to the war was incomplete and this resulted in the chaos of Army organization during the war. In addition to the existing organizations, more changes were introduced during the war.

Generally speaking, each Division had about 10,000 men with 3,000 rifles and carbines. The non-combatant count in the organization was relatively high and included horse raisers/handlers, cooks, messengers, etc. This and the combat losses, positions never filled, deserting soldiers, etc., all reduced the combat strength. This resulted in the loss of a lot of division level commanders in combat during the war. The general deployment rule was that one Chinese infantry division was a match for one Japanese brigade and one Chinese army corp. was a match for one Japanese division. In light of this, the army corps was made the basic tactical Unit in 1938.

Infantry was the main battle unit and rifles were the primary weapons. Due to the lack of artillery, armor and vehicles, the Chinese soldier had to do with they had, one rifle, two legs and a few grenades. This was how most combat was conducted.

The daily ammo supply for a Chinese rifleman was 60 rounds; the monthly supply was 300 rounds. There were supply depots located in each region; however, the troops were responsible to pick up the ammunition and transport it.

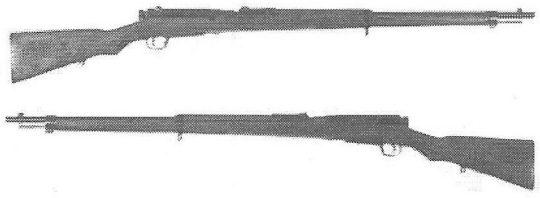
Section 2. Domestically Produced Rifles

『The new recruits needed not only military training but also basic civil education. It usually took 2-3 weeks to teach the recruits to read numbers, 2-3 weeks to understand the meter markings on the rifle sight and yet another 2-3 weeks to understand the ballistic trajectory. It would take 2-3 months just to teach a new recruit to know how to shoot.』

1945, the Snap Shots of the Youth Expedition Forces

Military Committee, Intellectual Volunteers Recruiting & Education Directorate, p. 135

I. Shanxi produced Type 38 Rifles



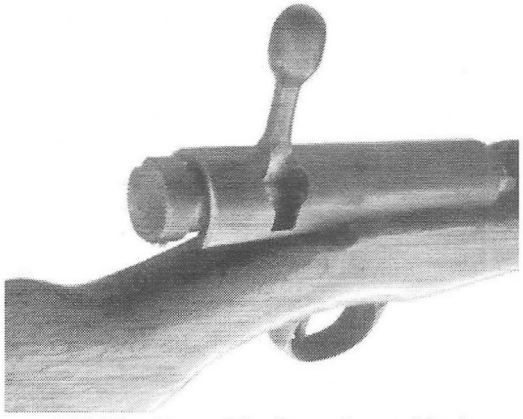
Type 38 Rifle Specifications
Operation Method: Manual Turn Bolt
O/A Length：1,276mm
Barrel Length：779mm
Caliber：6.5x50mmSR
Weight：3.96kg
Muzzle Velocity：762m/s
Feed：5-shot internal magazine

This was the rifle that Japan had standardized in 1905 (Meiji 38th Year). It is a modified Mauser action. The bolt has two front lugs and it is loaded with a 5-round stripper clip. The main difference between the Mauser and the T38 is the re-designed firing pin assembly, two receiver gas release holes, dust cover and push-in safety. It is a very simple, solid and battle proven design. It was the main battle rifle for the Japanese troops into the early 1940's. In 1917, the Beiyang (北洋) Government purchased 40,000 Type 38 rifles via the Taihei Kumiai. In 1926, when the Huang Pu Military Academy was first created, the Russians sent 4,000 Type 38 Rifles.

China was not the only country utilizing the Type 38. Russia issued the Type 38 to its troops in 1917 and the total purchase exceeded 600,000. Great Britain also purchased some Type 38 rifles during WWI.

Taihei Kumiai was the primary arms exporter for Japan. It was a conglomerate put together by Army Minister Terauchi Masatake in 1908, and consisted of Mitsui Bussan, Okura Shoji

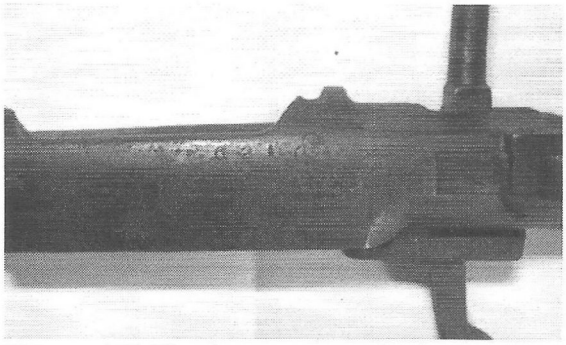
and Takada Shokai. Up to the time that the second Sino-Japanese War broke out; it was still dealing with various Chinese local warlords. Its purpose was to earn profits as well as to disrupt central government control.



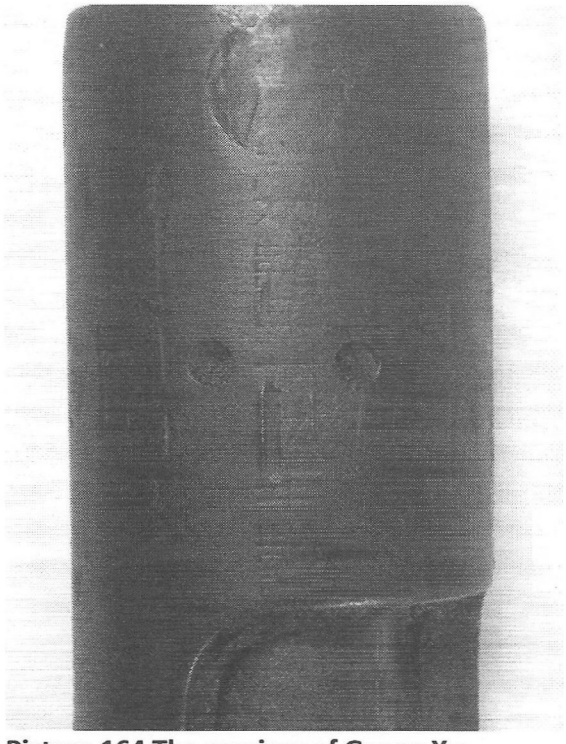
Picture 162 The Type 38 plum shaped bolt handle, dust cover and the push-in safety at the end of the bolt.

The Chinese called it the "38 big cover" (三八大蓋) and the name obviously came from the dust cover. The Chinese started importing Japanese rifles in the Qing Dynasty. Importation began with the Type 30 in 1903 and continued for several years. The imported rifles replaced the Japanese chrysanthemum with the Chinese circular Royal Dragon mark on the receiver. It also was marked with the year of importation.

『..in the winter of last year (1903),14,000 rifles were purchased from Japan and issued to the troops. The action was not that different from what the Japanese issued. The differences are that the rear sight was changed to the reversed ladder type, the Type 30 marking was replaced with Guang Xu 29 (光緒 29 年), the chrysanthemum was changed to the circular Royal Dragon (團龍)...』 [17]



Picture 163 The Guang Xu marked T30 rifle serial number.



Picture 164 The receiver of Guang Xu marked T30 rifle.

During the warlord period, there were many deals to purchase Type 38 rifles. Up to 1917, there had been a total of 206,401 rifles imported. There were also 150,967 Type 30 and 97,996 Murata Rifles imported. Based on a Japanese Army report, the Type 38 was widely used in the Northeastern Army, Northwestern Army, and by Guangdong, Shenxi and Fujian troops.[18]

[17] Zhang Yu Jun Report on Inspecting Beiyang Troops, Zhao Erxu (趙爾巽) Files.

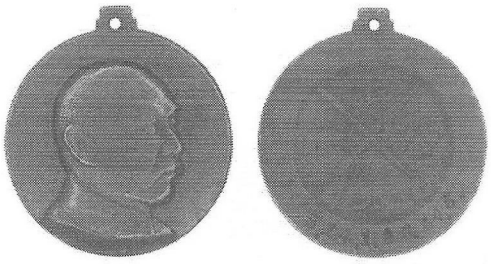
[18] See Appendix 5.

『I captured a Type 38 rifle, it is black and shiny.. load up a cartridge, the hatred concentrated on the front sight, aiming at the invader, shoot that wolf like animal, ba-go-hai, the bullet went right through its heart..... ....』(ba-go-hai (叭勾嘿) imitating the shot report)

I captured a Type 38 Rifle, Movie theme song of the "Two Young 8th Route Soldiers"

The primary producer of Type 38 copies in China was the Shanxi Arsenal. The Shanxi troops standardized on the 6.5x50mmSR until the war broke out. Some Shanxi guns are marked with "Jin Zao" (晉造) across the receiver and 65 Rifle (六五步槍) vertically. Some were just marked 65 Rifle. There were also quite a few that had "tian" (田) marked in front of the serial number. It is said that it was the last name of one of the Arsenal's superintendents. Shanxi had always been like an independent kingdom in China and it did its own thing. As mentioned before, the railroad tracks in Shanxi were narrow gauge track ; trains transporting troops after the war broke out had to switch cars at Shanxi's border. Most Chinese troops used 7.92mm cartridges hence it created a supply issue. After Taiyuan was lost, Yuan lost his cartridge production facilities so he started changing over to the 7.92mm as well.

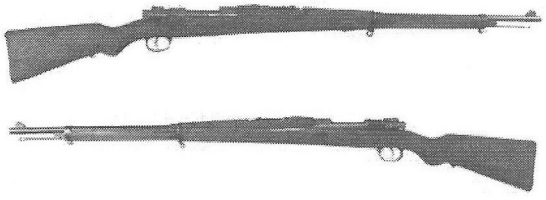
Picture 165 One example of Shanxi produced Type 38 rifle. Note that it's only marked "65 rifle." The dust cover was retracted to show the marking.



Picture 166 A "Promote Fairness" badge issued by Shanxi authorities. One side is Yuan's profile and the other side has the images of a T38 rifle and a hoe crossed.

All other production facilities produced much smaller quantities. Many rifles were made by workshops behind enemy lines during the war.

II. Liao produced (遼造) Type 13 Rifles



Type 13 Rifle Specifications
Operation Method: Manual Turn Bolt
O/A Length：1,250mm
Barrel Length：740mm
Caliber：7.92x57mm
Weight：4.27kg
Muzzle Velocity：~859m/s
Feed：5-shot internal magazine

There are still some disputes regarding where the Type 13's design came from. The popular legend of the time stated that it was designed by the then Superintendent Han Linchun (韓麟春), hence the nicknames such as "Han 79 Rifle", "Han Linchun Made" and so forth.

The reason for the dispute is it's very unique design – mixed features of Mauser 1907 and Japanese Type 38. The bolt is the Type 38 pattern - the main spring is enclosed inside

the firing pin body but the safety is still the Mauser wing type. The receiver has the pressure release holes, dust cover cut and dust cover.

Picture 4 The Type 13 receiver marking "Dong" (東). Gas pressure release holes are above the marking and the dust cover cut is visible on the lower left hand cornner.

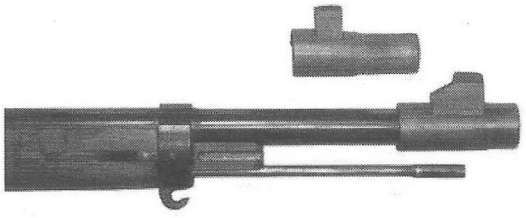
Some recent research showed that Austria designed a Model 1917 during WWI and it is very similar to the Type 13. The Ordnance Office Chief Yu also mentioned in his 1934 annual report that the drawings of the Type 13 were purchased from the Austrian company Steyr. These two facts actually collaborate.

Another theory was based on the special circumstances of the Eastern Three Provinces at the time. It states that the rifle was designed by the Japanese Arsenal and the prototypes were made in Japan. This also has some merit due to the statement of an old worker from the Japanese Arsenal recalling that they were making rifles for Marshall Zhang[19].

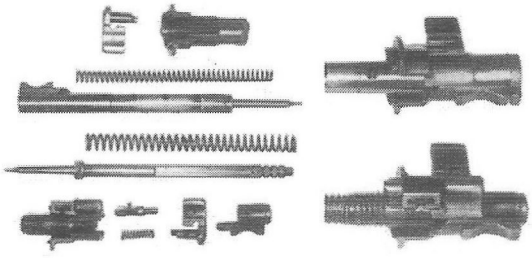
[19] Based on Fred Honeycutt's unpublished correspondence.

The Eastern Three Provinces Arsenal produced Type 13's were of very high quality. They were nicely milled, polished and blued. There are no visible tool marks.

However, there is a major design flaw. The bolt does not have a bolt sleeve stop. It is possible to rotate the bolt sleeve when the bolt is out of the receiver. This will prevent the bolt from returning to battery and if the soldier was not aware of the situation and tried to jam the bolt back into place, it would cause severe stock damage.



Picture 167 The muzzle cover for the Type 13. Fred Honeycutt collection.

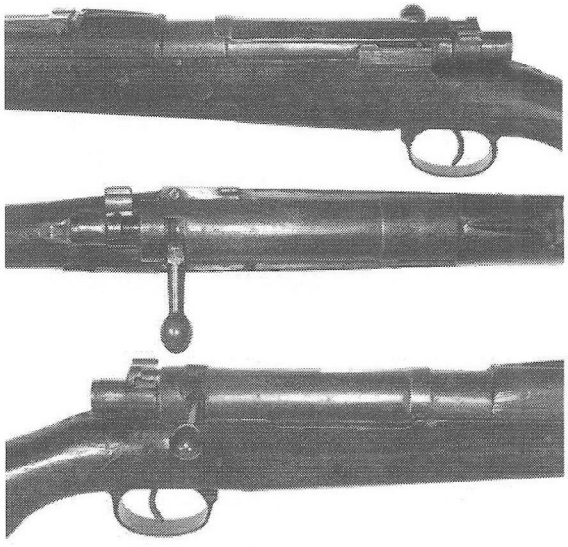


Picture 168 Left, top: the Type 13 bolt disassembled, below: the regular Mauser bolt disassembled. Right: a comparison of the bolt sleeve area. The Type 13 is on the top, missing the bolt sleeve stop.

The Type 13 monthly production started at 400 rifles per month and gradually rose to 4,000 at its peak. Based on the known serial numbers, the total production was probably around 140,000[20]. In 1920, the Northeastern Army entered the inner Great Wall area to "mediate" the Zhong Yuan Campaign. The

[20] The Chinese Model 13 Rifle, Stan Zielinski, The Military Rifle Journal, May 1998, Issue 89, p. 109 - 120

918 Incident soon occurred and there were 72,679 Type 13 captured by the Japanese Kwangtung Army in storage[21]. Later the now baseless Northeastern troops were sent to fight the Communist and suffered significant losses. The total number left in services when the Sino-Japanese War broke out may have been fairly small.



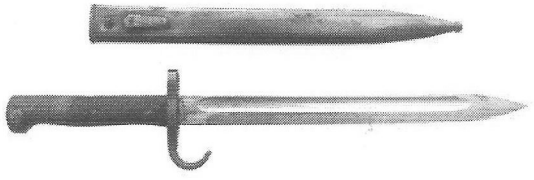
Picture 169 The early type dust cover for Type 13. Note the raised front. Source G.

Picture 170 The late type dust cover without the raised front. Curtsey of Fred Honeycutt.

The procedure to disassemble the Type 13 bolt is different from that of the regular Mauser bolt.

- Pull the bolt open and ensure that the rifle is empty.
- Close the bolt and put the safety in the vertical position.
- Pull the bolt to the rear while pressing the bolt stop to allow the bolt out of the receiver.
- Rotate the bolt sleeve counter clock wise to take out the bolt sleeve and firing pin assembly.
- Put the firing pin assembly into a take down hole like the ones on the 98k's or a solid wood surface. Apply steady pressure downwards and rotate the safety 90 degrees counter clock wise; the firing pin assembly will come apart.
- There is steel ring on the end of bolt sleeve; rotate it 180 degrees to take the safety wing out.
- As usual, assemble in the reverse manner.

The Type 13 is very popular with collectors. It is usually referred to as the "Manchurian Mauser." The collectability is mainly due to the unique features, good workmanship and scarcity. If anything is even scarcer it would be the bayonet for the Type 13. It has a hook quillion and muzzle ring, similar to the Japanese Type 30 pattern bayonet but much shorter.

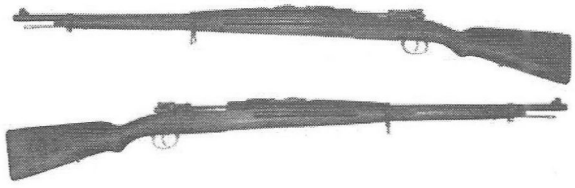


Picture 171 The bayonet for the Type 13 rifle.

After the 918 incident, in November there was a "Plain Clothes Riot" (便衣隊暴動) in Tientsin (天津). It was believed that the Japanese plotted the incident. The rioters were using Type 13 rifles without any unit acceptance mark on the stock. This report also revealed that the Tientsin Security Forces were issued Type 13 rifles and each had a unit acceptance mark on the stock. The riot was put down swiftly but Pu-Yi escaped to Manchuria under Japanese escort and eventually became the Emperor of Manchukuo.

[21] Eastern 3 Province Arsenal, Shen Zhenrong, Record of Liao Nin Historical Data, Vol 8, p. 62.

III. The Gongxian, Shanghai, Guangdong, and Guangxi produced (Mauser 1907 Pattern) Type 1st Year and Type 4th Year Rifle



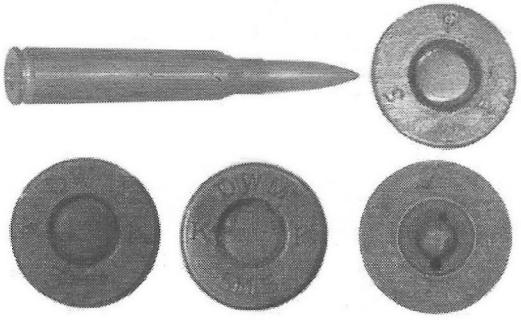
Type 4th Year Rifle Specifications
Operation Method: Manual Turn Bolt
O/A Length:1,255mm
Barrel Length：738mm
Caliber：7.92x57mm
Weight：4.08kg
Muzzle Velocity：859m/s (Gongxian 98 Rifle)
Feed：5-shot internal magazine

At the very end of the Qing Dynasty, the Chinese contracted with Mauser to produce a quantity of rifles in 6.8x57mm caliber. This was a caliber specifically developed for China. The rifle was commonly known as the Model 1907 and it was similar to the Model 1904.

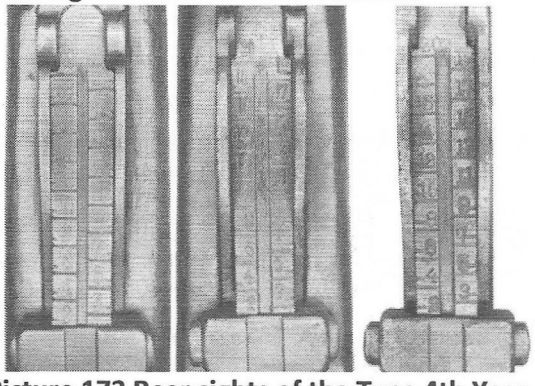
The adoption of the cartridge was the result of a lengthy debate between several high ranking officials in the Qing government about the relative merits of fast, small, light bullets vs. slow, large and heavy bullets. The center of the debate were the 7.9x57mm and the 6.5x50mmSR cartridges. In the end, the 6.8x57 was selected as a compromise.

The 6.8mm cartridge bullet weighted 9.01 g (139 grains) and the diameter was 7.04mm (.277 in). The cartridge case had the same length as the 7.92 round. The muzzle velocity was 650m/s.

The differences between the Chinese Model 1907 and the German Model 1898, were , among other things ,that the upper hand guard covered the rear sight and the bayonet lug was much smaller and of a different design. The rifle didn't utilize the capture screws for the receiver screws. The Qing Government at the time was in serious financial trouble and didn't have the funds to pay for the contract. Quite a few of these rifles were not delivered. They were later re-chambered to 7.92mm during WWI and issued to German troops.



Picture 172 Headstamps of some6.8x7mm cartridges. Top: Shanghai Arsenal. Bottom from left: DWM, DWM, and FN produced cartridges. Woodin Lab. Collection.

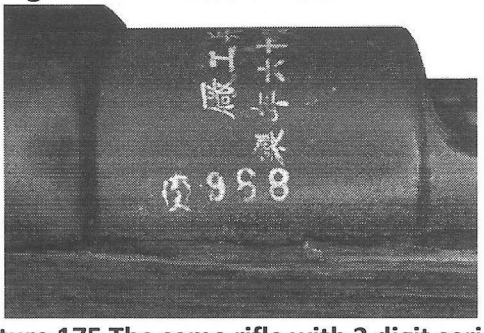


Picture 173 Rear sights of the Type 4th Year rifles; from left: Gongxian, Guangxi and Guangdong.

This pattern of rifle was soon locally produced in China. Guangdong Arsenal was the first to enter series production in 1904 with tools and drawings purchased from DWM. When the Republic was founded, the Army Department declared that this rifle would be standard issue and all arsenals should switch their production to this pattern. With the exception of Hanyang, which didn't have the funds to re-tool, all other arsenals

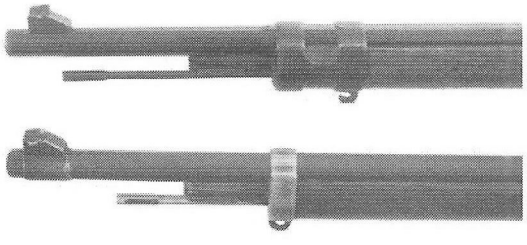
did switch to the Type 1st Year rifle production.

Picture 174 The Type 4th year rifle by Guangxi Arsenal made in 1927.

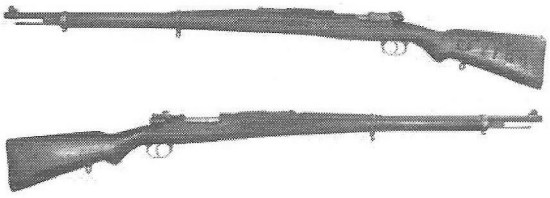


Picture 175 The same rifle with 3 digit serial number, indicated that there were only a small quantity produced.

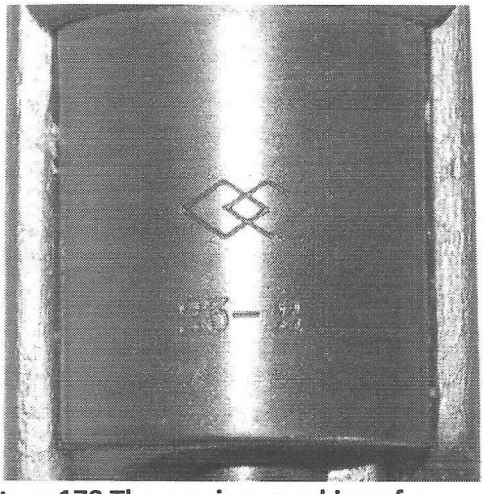
In 1915, after much debate, the standard cartridge was switched back to 7.92mm. The standardized model was called the Type 4th Year rifle. However, most sources simply referred to it as the 7.9mm Type 1st Year Rifle.



Picture 176 Comparison of the muzzle ends of a Mauser 1898 and a Type 1st Year rifle.



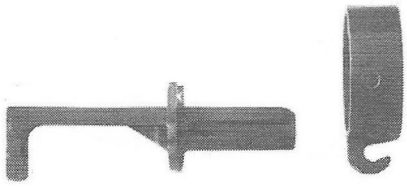
Picture 177 The same pattern produced by Gongxian Arsenal. It used the round nose 7.92 cartridge.



Picture 178 The receiver marking of a Gongxian rifle produced in February, 1934. The receiver was left in the white.

Picture 179 Troops parading with the Type 1st year rifles on October 10, 1942 in Chungking. Courtesy of Leeland Ness.

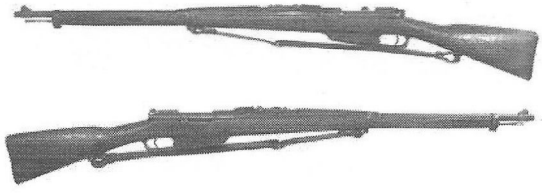
In the days of warlord infightings, the Type 1st Year rifles were for the most part the mainstay. With the exception of the Hanyang rifles, this was the most prolific produced arm.



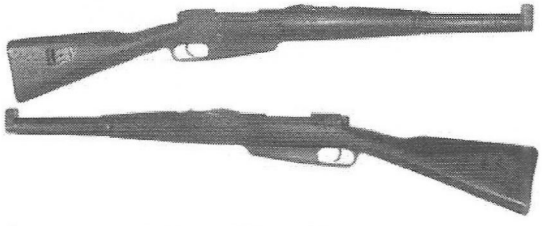
Picture 180 The front band and bayonet lug for the Type 1st, Type 4th and Type 13 rifles.

When the war broke out, the Type 1st Year rifles were already outdated and they were not considered first line rifles, most were in the hands of troops which had not been upgraded with new equipment.

IV. The Hanyang, Shanghai, Kaifeng, Shenxi, 21st Arsenal Produced Type 88 Hanyang Rifles



Hanyang Rifle Specification
Operation Method: Manual Turn Bolt
O/A Length：1,250mm
Barrel Length：740mm
Caliber：7.92x57mm
Weight：4.06kg
Muzzle Velocity：600m/s
Feed：5-shot protruding external magazine



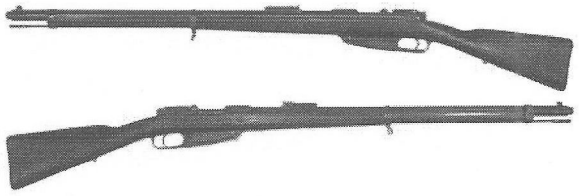
Picture 181 A Type 88 carbine, source unknown. It was identical to the Gewehr 91 carbine with the stacking hook removed. Source G.

Picture 182 Details of the above rifle. The root of the bolt handle has a star mark which only has 7 rays. The stock has a 3 ring marking similar to that of the Guangdong Arsenal. It has a regular round bolt handle vs. the spoon type.

Picture 183 A German Gewehr 91 without the front stacking hook.

In 1891, Viceroy Zhang Zhidong was building a new Arsenal in Hanyang, Hubei. He heard about the new German Gewehr 1888 Commission Rifle and cabled the 4-Nations Qing Ambassador Xu Jingcheng (許景澄) to change the contract to the new pattern. The

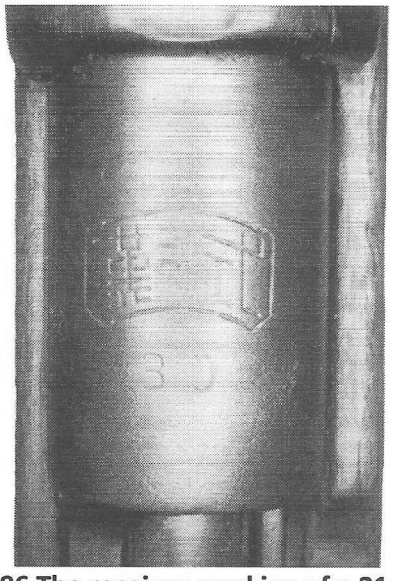
1888 Commission rifles used small caliber smokeless cartridges and full metal jacketed bullets. It was the cutting edge at that time in the world.



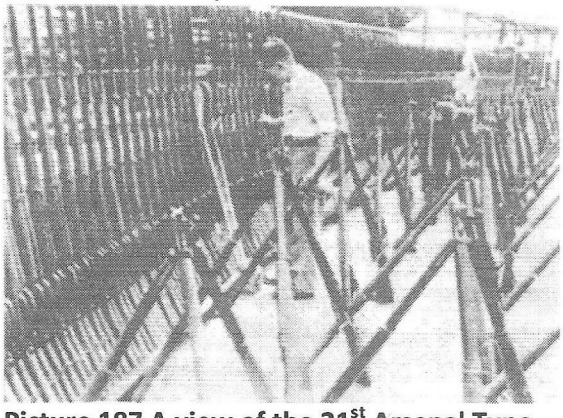
Picture 184 The Gewehr 1888 Commission Rifle. Note the jacket around the barrel.

In the winter of 1895, the Hanyang Arsenal was completed and began series production. In 1939, the rifle factory was transferred to the 21st Arsenal and production continued. In the 50 year span, there were around 1 million Hanyang rifles produced. Production finally ceased in 1944. It was the y model produced in the largest quantity in China at that time.

Picture 185 The cartouche on an early Type 88 carbine. The 6-pointed star was the Qing Army insignia. It was made in May, 1911 by the Hanyang Arsenal. Courtesy of Victor Lee.

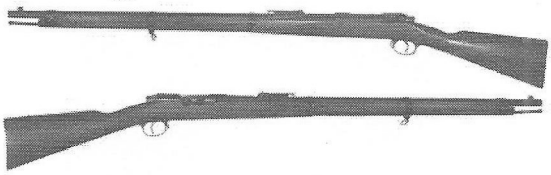


Picture 186 The receiver marking of a 21st Arsenal Han Rifle, made in 1941.



Picture 187 A view of the 21st Arsenal Type Han rifle production. Note the stacked guns in the foreground via their cleaning rod. Issue 157, Liang You Magazine, Shanghai.

This pattern of rifle with the barrel jacket was called "Old Shrouded Barrel" (老套筒) or "Double Barreled Rifle" (雙筒步槍). In August 1924, the head of the Guangzhou Chamber of Commerce (廣州商會), Chen Lianbo (陳廉伯), formed a paramilitary unit and purchased 4,000 German "Double Barreled Rifles." (9,000 were from a previous contract with some pistols and sub-machine guns and were already imported). This was the Guangzhou Chamber of Commerce Incident (廣州商團事件) and it was the first time that the students of the Huang Pu Academy (黃埔軍校) engaged in battle.

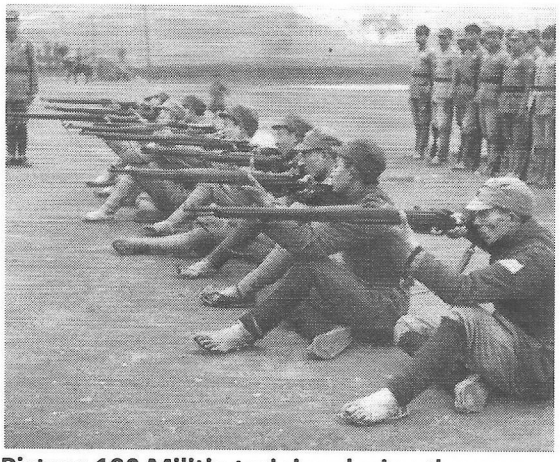


Picture 188 The Commission Rifle's design stemmed from the Mauser 1871/84. This was still in limited use during the war.

Picture 189 The Hanyang produced in the Kaifeng Arsenal, 1922 photo. Source A.

The early Hanyang rifles were made exactly like the Gew 1888 complete with barrel jacket until around 1904. The stock bore a cartoucheof a 6-pointed star (which resembled the Star of David) of the Qing Army.

In 1904, the barrel jacket was deleted and the barrel diameter was increased to matchwith the barrel band. In 1910, the upper hand guard was added and the rear sight was changed to the Mauser Model 1898 type.

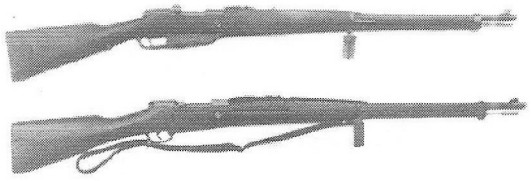


Picture 190 Militia training during the war. Note that the 3 trainees at the right are using 3 different types of Hanyang rifles. Source A.

Picture 191 A Hanyang Carbine. Source B.

Hanyang also produced a carbine version and there were at least 2 different types. One was the Mannlicher type similar to the Gew 91 configuration; the other type seemed to be just a cut down version with shortened barrel, stock and hand guard.

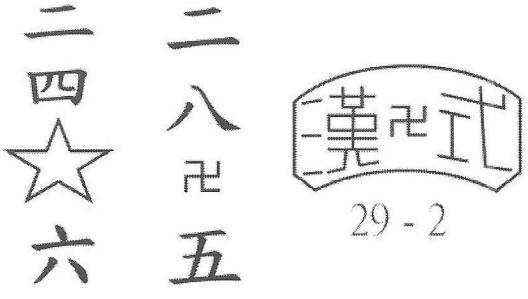
Based on Japanese data, there was another version called the Type 23. It seemed to be a blend between the Mauser 1898 and Hanyang. The most prominent change was that the protruding external magazine was eliminated. It is likely that it also changed the feed system to the charger loading type with an internal magazine. This has not been seen in any other document so it might have been just an experimental model.



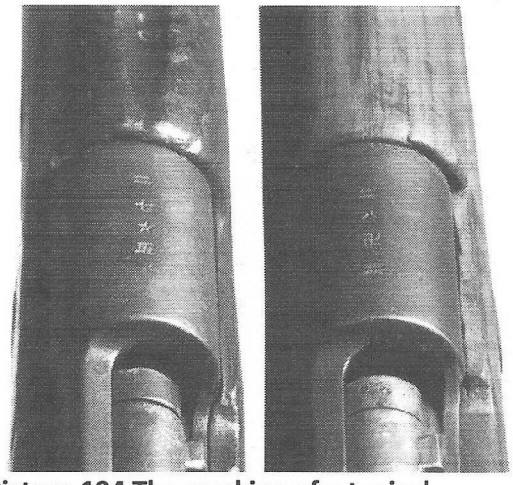
Picture 192 Picture from the Shinagun Heiki Yoran; Hanyang on the top and the so-called Type 23 on the below. Note the bolt handle position and the absence of the protruding magazine. Source A.

German 1888 rifles also found their way to China in large quantity after WWI, as in the above mentioned Guangzhou Chamber of Commerce Incident. In 1928, the Yunan Government acquired 5,000 1888 rifles from French sources.[22] Many other imports were not documented and there were still fairly large quantities in use by local troops when the war broke out.

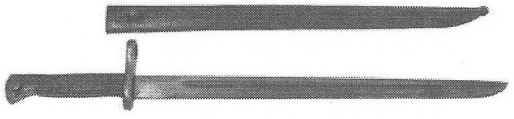
Hanyang rifles were still first line weapons during the war. Even though it was two generation behind the Zhong Zheng Shi, one generation behind the Type 38, it was still a very solid and dependable combat weapon.



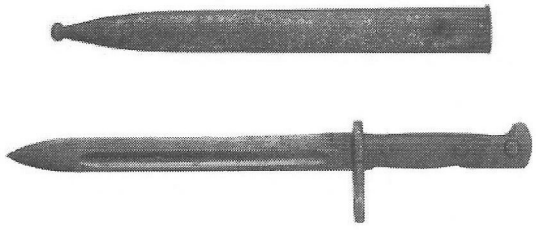
Picture 193 The three different kinds of receiver markings before and during the war. From left: Hanyang Arsenal, early 21st Arsenal and late 21st Arsenal. The name was changed to Type Han encircled in a banner.



Picture 194 The marking of a typical Hanyang produced Type 88 and an early type produced by the 21st. Courtesy of Xu Lin.



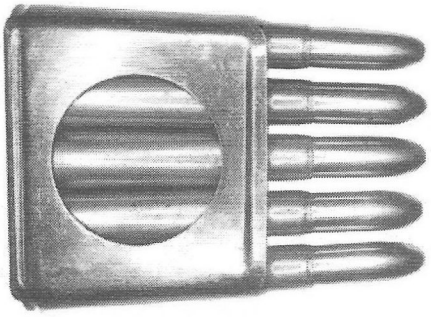
Picture 195 The long type Hanyang Bayonet. Note that the blade is similar to the Japanese Type 30. The blade is 397mm and the overall length without scabbard is 520mm.



Picture 196 The short type Hanyang Bayonet. The blade is 245mm and the overall length without scabbard is 370mm.

[22] French foreign ministry archives, file on the sale of arms to Yunnan in the 1920s.

Picture 197 A camouflaged Chinese soldier holding a Hanyang rifle with a long bayonet fixed. Black Star Photo, Source A.



Picture 198 The clip and ammunition for the Hanyang rifle. The round nose cartridge was produced in parallel with the spitzer cartridge in China throughout the war.

To load a Hanyang rifle, a clip must be used. This was invented by Mannlicher and was considered inferior to the later Mauser charger loading. In addition to the need for a clip , another complaint was that the clip loading system couldn't be topped off.

The production of Hanyang rifles				
1895-1909	1910-1932	1932-1938	1939-1944	Total
130,036	463,180	283,100	207,164	1,083,480
	Based on serial numbers	Based on serial numbers		

Comparatively speaking, the Hanyang rifle was as good as the Type 38. The weight was comparable but the 7.9mm cartridges were much more powerful. Japan even took some captured Hanyang rifles and converted them into training rifles, most likely for school training. Fundamentally, there was no major design flaw in the Hanyang rifle. If anything, the extractor was not a good design; it was a 2-piece affair and was too weak for the 7.9mm rounds. Over time, the extractor could lose its strength and start developing extraction problem. It was also a very small part and easy to lose during cleaning

Picture 199 A poster produced in 1945 by the US Army Psychological Warfare Dept. It was customary for Chinese to put new "Door God" prints on their doors for the New Year. These prints came in pairs, the other one of this pair is in the Thompson section of this book. This new "Door God" has a Hanyang rifle to fend off evil spirits.

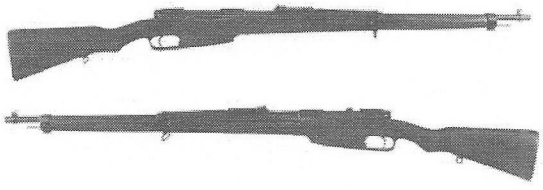
When firing is no longer required and there are still cartridges in the clip, there is a knob on the trigger guard to eject the clip with the remaining cartridges. The opening underneath the magazine was for the empty clip to fall out. There are quite a few old rifles with clips stuck in the magazine. This author had heard about this before and actually found one in a Gew 91 rifle. You may also find a clip in the magazine next time you handle one of these rifles.

Picture 200 Troops with Hanyang rifles and short bayonets near Shanghai in a bamboo grove during the "128 Incident". Courtesy of Leeland Ness.

Type Han Rifle Production in the 21st Arsenal

Year	1939	1940	1941	1942	1943	1944
Type Han Rifle	41,500	53,814	31,500	46,600	33,400	350

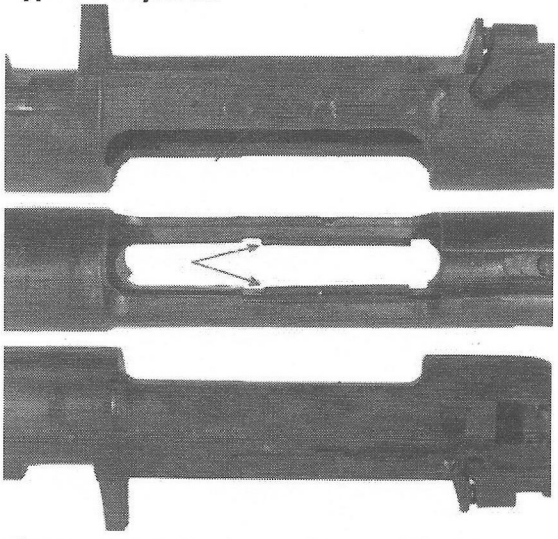
Picture 201 A group of gas masked soldiers with Hanyang rifles and a variety of other rifles. Da Mei Periodical, Issue 6, #2.



Picture 202 IJA modified Gew 1888. IJA captured many Hanyang and Gew 1888 in China, some were modified and believed to be used as training rifles. This example was a Gew 1888 modified, it remained in 7.92 caliber but the outer dimension is 13.65mm (instead of original 13.00mm-without barrel jacket) and utilizes a Japanese T30 bayonet.

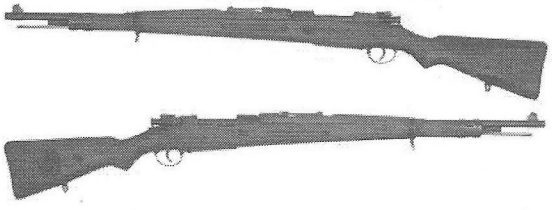
Picture 203 The above rifle with a T30 bayonet mounted.

Picture 204 A Japanese modified captured Model 1888. It was turned into a single shot rifle probably for training purpose. The front band was changed to accept the Japanese Type 30 bayonet.



Picture 205 A Hanyang rifle modified to accept Mauser charger loading. Both sides of the receiver were slotted. On the right side a piece is soldered in the slot. The left side has a screw secured spring installed in the slot. The two pieces together would hold the cartridges down. Time and place of modification unknown.

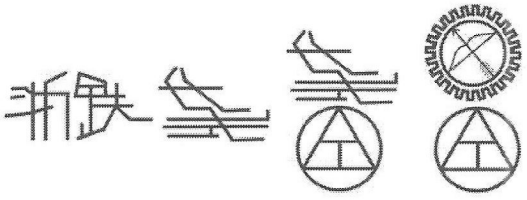
V. Type 77 Rifle produced by Zhejing Iron Works



Type 77 Rifle Specifications

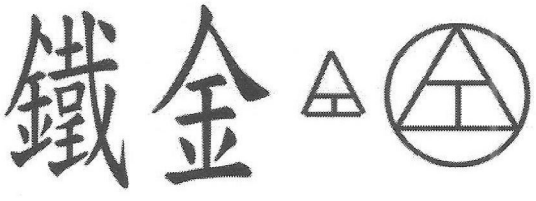
Operation Method: Manual Turn Bolt
O/A Length：1,110mm
Barrel Length：600mm
Caliber：7.92x57mm
Weight：4.08kg
Muzzle Velocity：853m/s
Feed：5-shot internal magazine

The Governor of Zhejiang Province, Huang Shaohong, created an arsenal to produce small arms during the war.



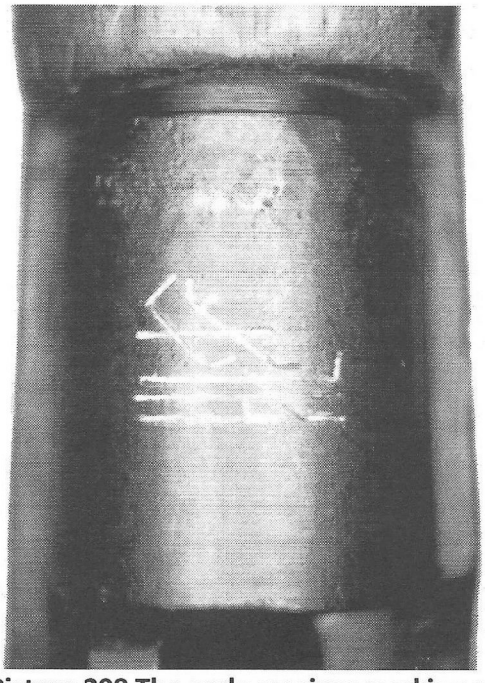
Picture 206 The progression of the receiver markings for the Type 77 Rifle, starting from the left.

The workers recalled that they received the order to produce a rifle but they really couldn't do it. They took an FN 1930 rifle, ground off all markings and submitted that to Huang. Huang was delighted and ordered them to make more! It took a while but the workers finally got it done and started making rifles. The rifles were issued to Huang's provincial self-defense units, the excess rifles were sold to other provincial militia and sometimes even regular army units.

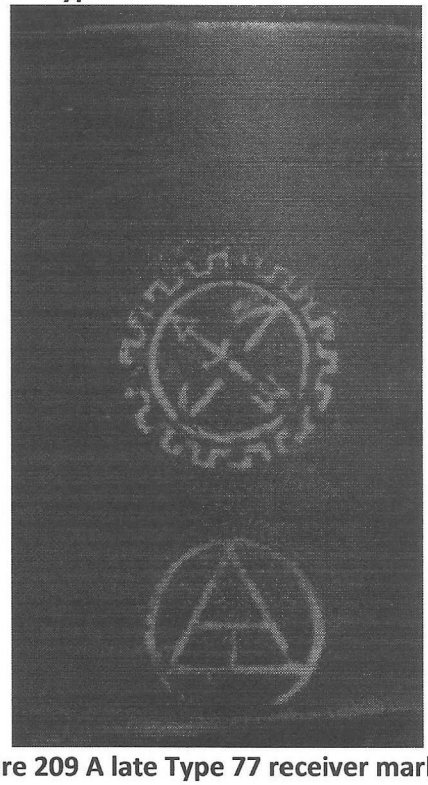


Picture 207 The evolution of the Zhejiang Iron Works arsenal marking. From the left: Chinese character "Iron."Taking the "metal side" of the iron on the left - only the top part and finally encircling it just like the period markings of other Chinese arsenals.

In addition to rifles, the Zhejiang Iron Works also produced grenade launchers, ZB-26 LMGs, mortars, hand grenades, etc. Huang named them all "Type 77" to commemorate the July 7 Marco Polo Bridge Incident in 1937.



Picture 208 The early receiver marking of a Type 77 Rifle. Atthe top "77" and at the bottom "type."



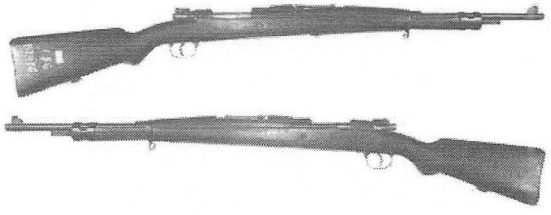
Picture 209 A late Type 77 receiver marking. Most likely it was produced in the Fujian location.

The Type 77 bolt is a standard Mauser type but it does not have the guide rib. The

receiver does not have the cutout either so the regular Mauser bolt will not fit. It is however interchangeable with the Liao Type 13 bolt.

Picture 210 Typical receiver marking of an FN 1930 short rifle.

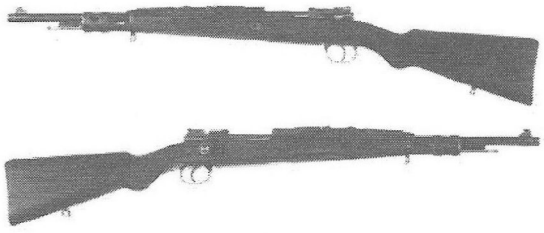
The Fabrique Nationale in Belgium was first set up in the late 19th Century to produce Mauser pattern rifles for the government. After the completion of the contract, it developed a relationship with American arms inventor John Browning. It continued to produce arms for countries around the world and became one of the largest arms suppliers in the world.



Picture 211 An FN 1930 export rifle for China. Source F.

After WWI, Germany was banned from exporting arms under the restriction imposed by the Versailles Treaties. FN and Brno in Czechoslovakia quickly rose to fill the vacuum.
The FN 1924/1930 short rifles were also evolved from the Mauser 1898 and developed based on the experience Germany gained in WWI. The interesting historical fact was that Mauser, FN and Brno all offered a new pattern short rifle about the same time and there were a lot of similarities between them.

The unique feature of the FN rifle was the upper hand guard that covered the rear sight but did not extend to the front band. The front band and rear band were secured by two guard springs in the Model 1898 fashion.



Picture 212 An FN 1924 Carbine.

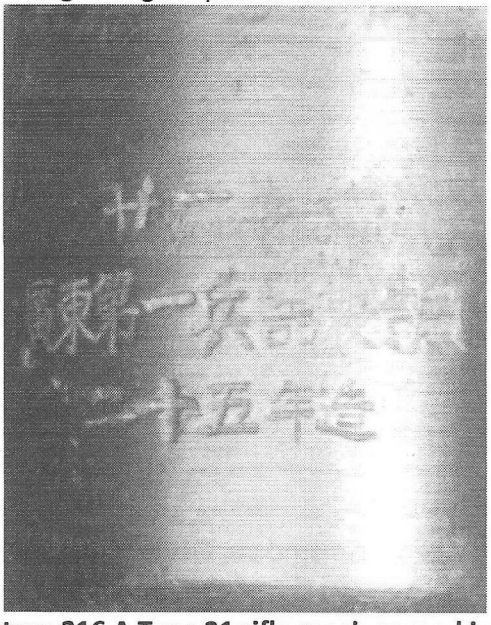
Picture 213 A Chinese soldier with an FN 1924 Carbine standing guard at a Burma Road inspection point. War Illustrated, Vol. 9, 8/31/1945

Picture 214 August 27, 1937, Japanese military personnel are examining captured Chinese arms in Fengtai (豐台). There are an FN 1924/30 and two VZ-24s on the right in the picture. Source A.

China imported 154,655 FN rifles via Hong Kong between 1935 and 1939. There were some 20,000 that were designated for Guangdong and Guangxi, 2,400 for the city of Tientsin and the rest were for the Nationalist Government after 1938. [23]

Picture 215 Troops in Yunan that appear to be equipped exclusively with FN rifles. Source D.

Guangdong Arsenal started producing a copy of the FN 1924/30 rifle in 1932. It was called the "Type 21." The production rate in Guangdong was reported in 1920 as 1,200 rifles per month. The total production of Type 21 in the next 4 years probably exceeded 50,000. The Ordnance Office took over the Arsenal in 1936 after Chen Jitang was deposed, and production was changed over to Zhong Zheng Shi pattern rifles.



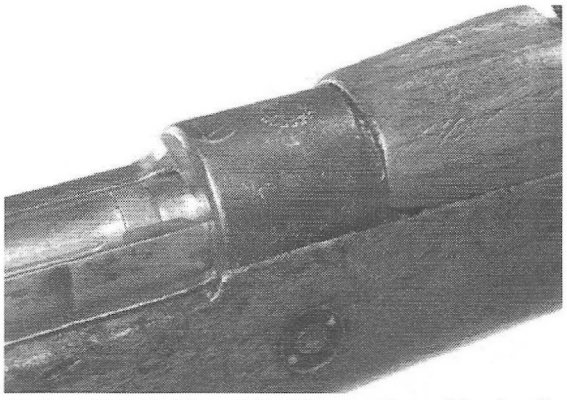
Picture 216 A Type 21 rifle receiver marking, produced in 1936.

The total number of Type 77 rifles produced was probably between 30,000 to 40,000. The steel was from the rail road track taken from the Hu Hang Line (滬杭鐵路). The 1939 report from T.M.H. Pardoe stated that there was still one year worth of steel in stock. The iron, gun powder and explosive were readily available locally; the most difficult material to obtain was copper for cartridges. The Japanese blockade of Wenchow (溫州) harbor made the situation more desperate.

Due to the shortage of good steel, a lot of the parts of the weapons produced in the Zhejiang Iron Works were made out of iron. This made the product heavier and reduced the efficiency.

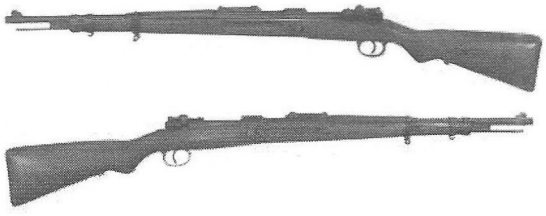
---

[23] Rifle Imports for China 1933 – 1941, Stanley J Zielinski,

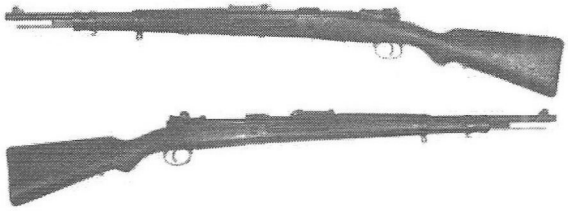


Picture 217 A Type 77 rifle produced in April, 1945, serial number 30917. The manufacture dates were marked on the right side of the receiver ring as in FN rifles.

VI. Gongxian, Guangdong, the 21st and the 1st Arsenal Zhong Zheng Shi (Chiang Kai-Shek) Rifles

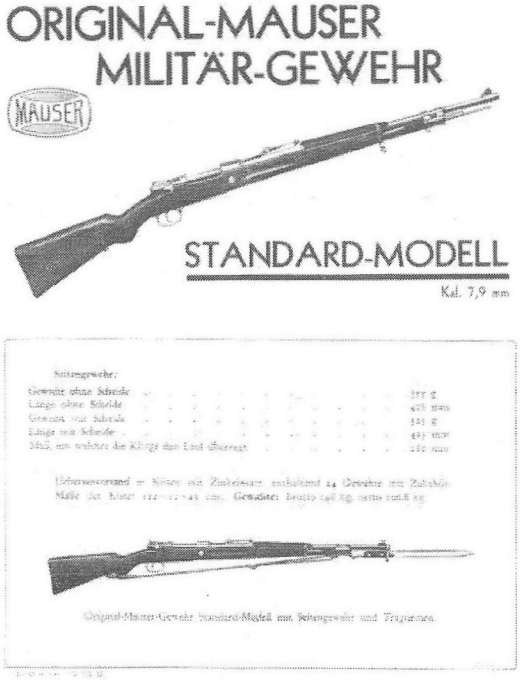


Zhong Zheng Shi Rifle Specifications
Operation Method: Manual Turn Bolt
O/A Length：1110mm
Barrel Length：600mm
Caliber：7.92x57mm
Weight：4kg
Muzzle Velocity：810m/s
Feed：5-shot internal magazine



Picture 218 German Mauser Standard Modell.

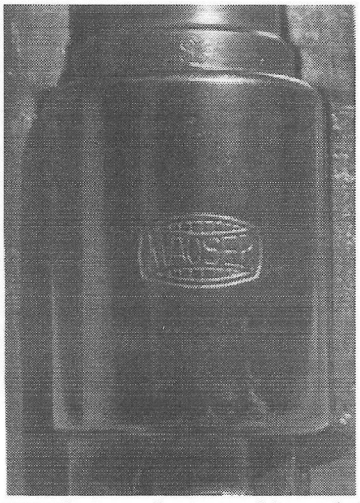
The Zhong Zheng Shi rifle was a licensed copy of the Mauser Standard Modell. It was developed out of the experience Germany learned from WWI. Substantial improvement was made over the Mauser Model 1898. The design was completed in 1924 but production only got under way in the early 1930s. The name Standard Modell came form the 60cm barrel length that implied it was suitable for both infantry and cavalry



Picture 219 Mauser pamphlet for the Standard Modell rifle.

In 1932, there was a National Armament Standards Conference (全國制式武器會議) held in China to determine suitable armament standards. The 7.92mm Mauser 1924 rifle (The term 1924 rifle was not used in German nomenclature but it is quite popular in Chinese historical records along with Vz-24 and FN1924) was chosen to be the standard issue battle rifle. The Conference was attended mostly by ordnance experts and academics so the weapons selected tended to be idealistic and most didn't become a reality – such as the US 1911 pistol as the standard sidearm. However, the Mauser 1924 was the exception; it did become the standard issue for China for years to come.

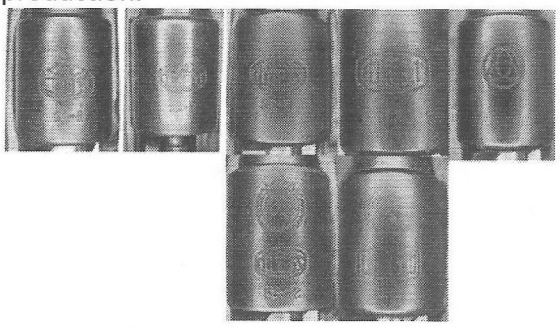
Picture 220 Rifle training in Kunming Infantry Training Center. Note the sling around the upper arm to improve aiming stability. This was something never propagated in Chinese troops. Also, the sun helmet sitting on his back bears a Nationalist Star on the front.



Picture 221 The receiver marking of the Mauser banner on the Standard Modell.

The first introduction of the Standard Modell in China was in 1934. The Ministry of Revenue purchased 10,000 Standard Modell rifles to arm the Taxation Patrol (稅警總團). The Ordnance Office took the opportunity to request the design prints, parts list, and proof jigs from Mauser. They were turned over to Gongxian Arsenal to prepare the production templates and tools. The production was planned to start in October, 1934.

However, they found the jigs were worn out and the prints had errors in them. The Ordnance Office officially made a formal request for the prints to German authorities. The Superintendent of Gongxian Arsenal, Mao Yike (毛毅可), a graduate of the Technische Universitaet Berlin (柏林工業大學), was assigned the task to go to Germany to obtain the information. The new prints and jigs arrived in 1935 and were again turned over to Gongxian Arsenal to prepare for production.



Picture 222 Various receiver markings on Zhong Zheng Shi rifles, starting from the left: Type 24, from Gongxian, the 1st, the 21st and the 41st. The ones on the second line were the later version with the Ordnance Office Bow and Arrow in a Gear marking added.

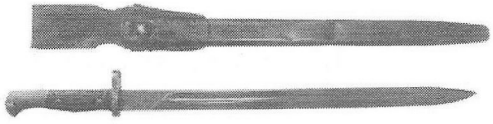
Limited production started in July, 1935. The model name was originally designated as "Type 24."The receiver marking was a banner similar to the Mauser and with the Chinese characters "Type 24" inside.

It was said that during the trial runs Chiang Kai Shek visited the arsenal with his wife Madam Chiang. Chief Yu of the Ordnance Office proposed and it was approved to change the model designation to "Zhong Zheng Shi Rifle Carbine" (中正式步騎槍). It went into series production on October 10, 1935.

Picture 223 Left: A young soldier with a M35 helmet and a Zhong Zheng Shi rifle. Source D.

Right: A period pictorial featured a soldier with a Zhong Zheng Shi rifle on his back.

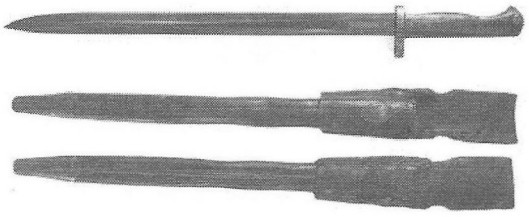
From the production perspective, the Zhong Zheng Shi rifle was the first coordinated effort to produce a standard rifle with which to equip all the troops. In 1937, the Ordnance Office issued the "Material Standards Regulation for the Zhong Zheng Shi Rifle." (中正式步槍應用材料之規範) It was based on the German Industrial regulations. It covered the part name, material for the part and the chemical and mechanical specifications for the part.



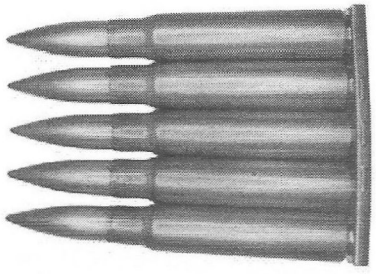
Picture 224 The Zhong Zheng Shi rifle bayonet, sheath and frog. Note that the blade is similar to the British 1907.

The 21st Arsenal received orders to switch production from the Type Han rifle to the Zhong Zheng Shi in 1940. It started the preparations by examining the Mauser Model 1898 prints on hand and used these as the basis for the new rifle. It took them 3 years to tool up and start production. This was a very strange approach as both the 1st Arsenal and the 41st Arsenal were in production at that time. Why didn't the 21st Arsenal take their prints and start from there? Possibly the prints from the 1st Arsenal, which were hand-me-downs from the 11th Arsenal, were badly damaged during air raids and were not complete? Or possibly the 1st and the 41st Arsenals were merely making the rifles using jigs and templates? Especially during the heat of Sino-Japanese War and the tremendous pressure for more arms it is hard to understand the delay. Regardless of the reason, the 21st Arsenal started production in October 1943 and within two years it became the largest producer of Zhong Zheng Shi rifles in China.

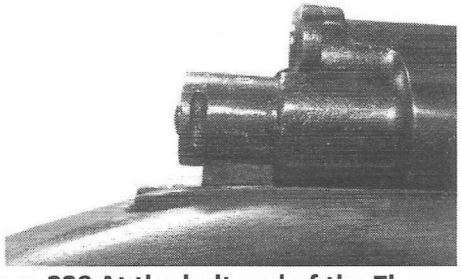
Picture 225 The Zhong Zheng Shi rifle has the typical Mauser stepped barrel.



Picture 226 The bayonet produced by the 21st Arsenal. The bayonet itself is identical to those made by other arsenals but it has a leather scabbard.

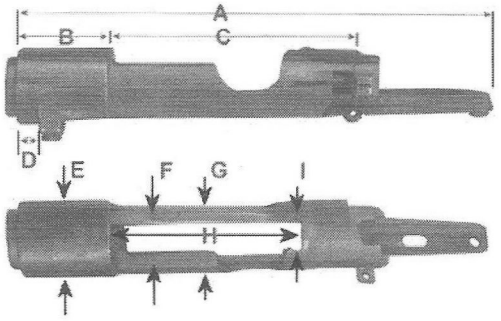


Picture 227 7.92 cartridges in the typical Mauser rifle type 5-round charger.



Picture 228 At the bolt end of the Zhong Zheng Shi rifle there is the standard slot cut for re-cocking the bolt with a cartridge rim in case of an ignition failure.

Receiver measurement comparison for Zhong Zheng Shi rifles										
Arsenal	A	B	C	D	E	F	G	H	I	Note
Gongxian 003157	221.00	43.15	110.54	10.70	35.61	27.54	31.90	87.06	13.41	Pre-production, Sept. 1935
Gongxian 08156	221.00	43.13	110.86	11.08	35.89	27.25	31.98	87.10	13.54	Type 24 Model, Aug. 1935
Gongxian P00791	221.00	43.13	110.30	10.30	35.79	27.95	32.09	87.43	13.29	Mass Production
The 1st J8026	221.00	42.80	110.03	11.65	36.21	27.92	32.66	87.30	12.97	Sept. 1944
The 1st L1182	222.00	43.20	110.41	11.29	35.64	28.11	32.39	86.46	13.50	Feb. 1945
The 21st A1721	221.00	43.07	110.28	10.34	35.79	27.78	32.71	86.76	13.23	1943
The 21st D9319	221.00	42.93	110.67	10.70	35.76	28.17	32.33	87.32	13.46	
The 21st AH7706	221.00	42.80	110.86	11.03	35.53	27.63	32.38	87.07	15.64	
The 41st 73131	222.00	43.56	111.03	10.89	35.99	30.09	32.97	86.96	13.34	
The 41st 85207	222.00	43.07	110.24	11.24	36.44	28.28	32.96	87.34	13.72	
Mauser B56036	221.00	42.75	110.65	10.56	35.80	27.48	31.84	87.11	13.53	Standard Modell
Mauser B44614	221.00	42.86	111.01	11.84	35.95	27.99	31.74	87.03	15.56	Standard Modell
Mauser 5423e	221.00	42.86	110.71	11.04	35.86	27.32	31.72	86.89	15.80	Chinese contract 98k
Unknown 3921	224.00	43.60	108.13	N/A	35.63	30.63	32.75	84.74	13.90	Standard Modell copy
	Unit: mm					(Narrowest)	(Widest)			



Picture 229 The top and left side view of a standard Zhong Zheng Shi receiver. Letters are keys to the previous comparison chart.

Differences among Zhong Zhneng Shi rifles from different arsenals

Although they're all called Zhong Zheng Shi rifles and they were supposedly all made under Ordnance Office supervision, there were still variances between rifles from different arsenals and parts are not all interchangeable.

Stock:
There are visible differences in stock shapes between the different arsenals. There are at least three known types: the 1st Arsenal succeeded the 11th Arsenal so these stocks are basically the same. The 1st Arsenal stock had the lowest comb nose. It measured only 62.4mm to the back of the pistol grip. The 41st Arsenal stock was 65.3mm and the 21st Arsenal stock was the highest at 70.2mm. The inletting of the stock was also a little bit different so one can't just drop the barreled action into any stock.

A lot of collectors like the so-called "cartouche" on the stock. These were actually applied after the Korean War when these guns were transferred to the People's Militia. Most of these cartouches were applied before the 1956 "Simplified Chinese Standard" went into effect. Hence the characters are mostly in traditional Chinese format.

Fonts:
There were also differences in the fonts used for the numbers on the rear sight blade. Each arsenal used its own font and, one can tell the producer of the rifle by just looking at the fonts.

Front band:
It is known that the 1st Arsenal and the Gongxian Arsenal used a milled front band with a parade hook. The 21st Arsenal used a stamped seamless steel tube and the 41st Arsenal used welded steel plate- there are weld marks inside the band.

The Parade Hook:
The Standard Modell evolved from the Mauser 1898 and retained the parade hook feature. The Zhong Zheng Shi rifle from Gongxian Arsenal also had the parade hook under the front band as did as some of early rifles from the 1st Arsenal. The parade hook design required three parts: the hook itself, the sling hole in the front of the trigger guard, and the detachable rear sling swivel base.

Serial Numbers:
When the rifles first entered production in the Gongxian Arsenal, the serial number consisted of a six digit format such as 000234. After the arsenal moved to Chungking, the serial number changed to an English letter

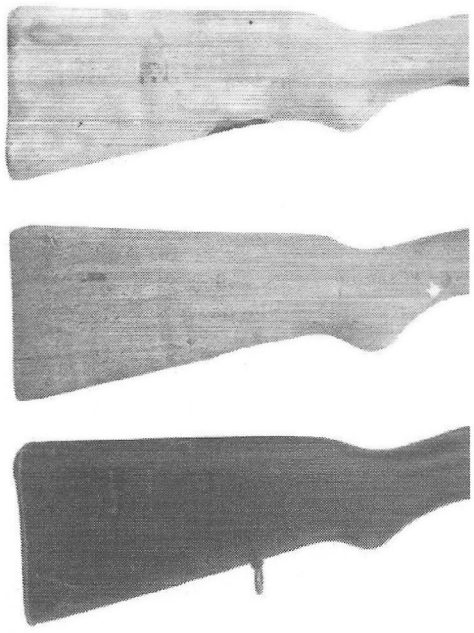
Zhong Zheng Shi Rifle Production Figures during the War									
Year	1937	1938	1939	1940	1941	1942	1943	1944	1945
11th Arsenal	40,000	30,000	20,000	20,000	5,000				
21st Arsenal								24,500	62,000
1st Arsenal						7,000	23,000	32,000	32,000
41st Arsenal	5,010	8,000	10,000	15,600	15,600	7,000	10,000	11,000	8,000

prefix plus five digits such as N00123. The reason it started with N was probably because there were 130,000 rifles made prior to this change. The known prefixes are N, O, P, Q and R. These rifles only had the production month without the year. After the arsenal started using the five-pointed star of the 1st Arsenal, it again changed to an English prefix plus 4 digits such as E1234. The reason it started with E was probably because it had already produced 40,000 guns. The highest prefix observed is P.[24] These rifles were marked with both the year and month of manufacture, such 27-2, indicating manufacture in February, 1938.

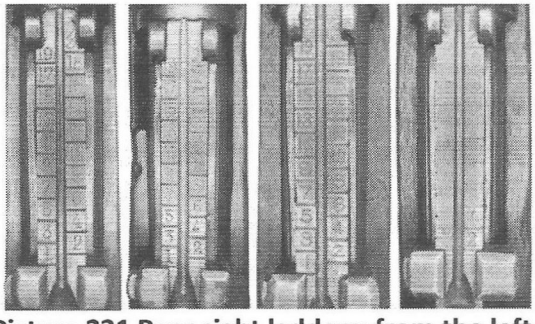
The 41st Arsenal used a five digit format such as 7231. The rifle usually doesn't have a production date. A way to approximate the date is to note thay, other than the 8 months between 1939 and 1940 when production was halted due to relocation, the arsenal produced some 1,000 rifles per month. The total production is estimated at around 80,000 rifles.

The 21st Arsenal also used an English letter prefix plus 4 digits format such E3211. The receiver was only marked with the year of production. Due to the large number produced, it added another letter post war such as AA, AB, etc. By the end of 1945 it had already produced 86,500 rifles.
Based on this data, this author estimates the total war time production was around 360,000 rifles.

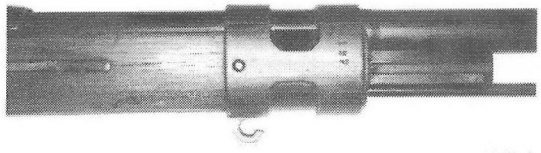
The Zhong Zheng Shi rifle was one of the most advanced rifle designs during the war. It was ahead of the Russian, Japanese and British standard issues. However, raw material supply and production capability in China severely limited the production numbers and its effectiveness.



Picture 230 The variance in stock shape, from top: the 21st Arsenal, the 41st Arsenal and the 1st Arsenal.

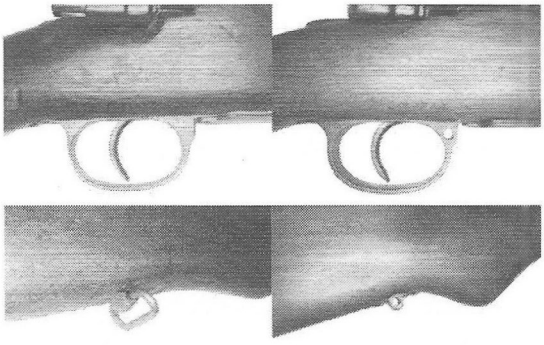


Picture 231 Rear sight ladders; from the left Gongxian, 1st , 41st and 21st Arsenals.



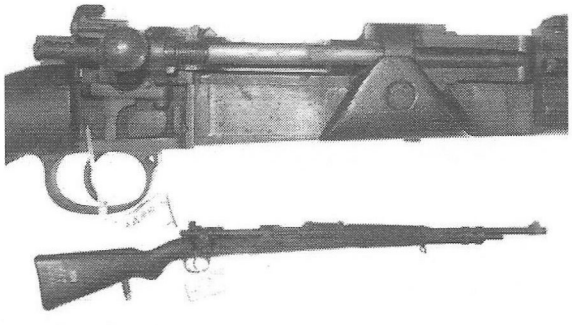
Picture 232 Mauser Standard Modell and Gongxian Zhong Zheng Shi rifles all had parade hooks. The front band was secured by a cross pin, and the rear[nd] band was secured by a band spring. The K98k replaced the cross pin with an extended band spring that secured both bands.

[24] Reference 27.

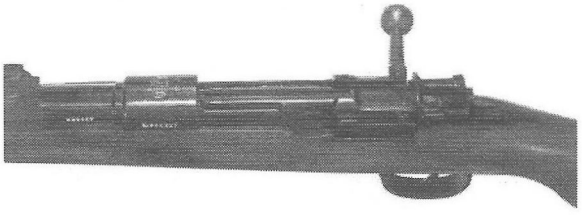


Picture 233 The other two parts of the parade hook feature, on the right: the sling hole in the front of the trigger guard and the detachable sling base on the buttstock.

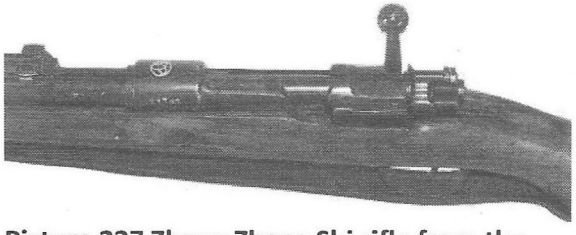
Picture 234 Kunming Infantry Training Center, 1945, Battalion Commander Major Liu (103D, 308R, the 2nd Battalion) is inspecting a Zhong Zheng Shi rifle. Source D.



Picture 235 A cutaway Zhong Zheng Shi rifle used for educational purposes. Source F.

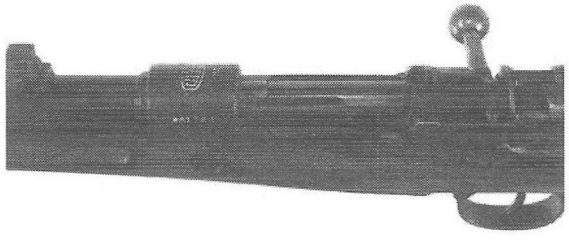


Picture 236 Zhong Zheng Shi rifle from the Gongxian Arsenal.

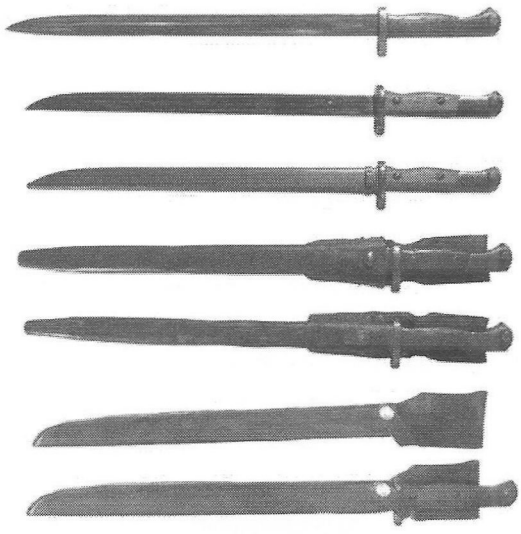


Picture 237 Zhong Zheng Shi rifle from the 41st Arsenal.

Picture 238 Zhong Zheng Shi rifle from the 1st Arsenal.



Picture 239 Zhong Zheng Shi rifle from the 21st Arsenal.



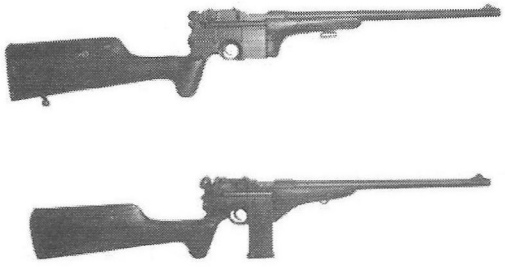
Picture 240 Various types of ZZS bayonets and sheath. The second one from the top has the Japanese T30 blade and the third one is with the T30 sheath. It is believed that they're modified T30 post war. The last two showing the last ditch leather sheath of the Chinese Civil War.

VII. Mauser Model 1896 Carbine

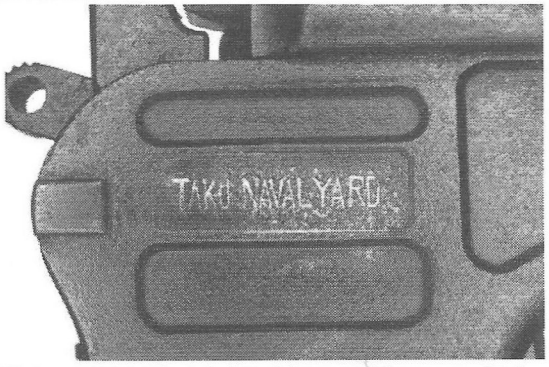
Picture 241 The Mauser 1896 carbine with 10 round internal magazine, made by Taku Dockyard. Source G.

Mauser 1896 Carbine Specification
Operation Method: Short Recoil
O/A Length：895mm(406mm barrel)
Barrel Length：254-406mm
Caliber：7.63x25mm
Weight：1.3kg
Muzzle Velocity：490m/s
Feed：fixed 10/20 round internal magazine, 10/20 round box magazine

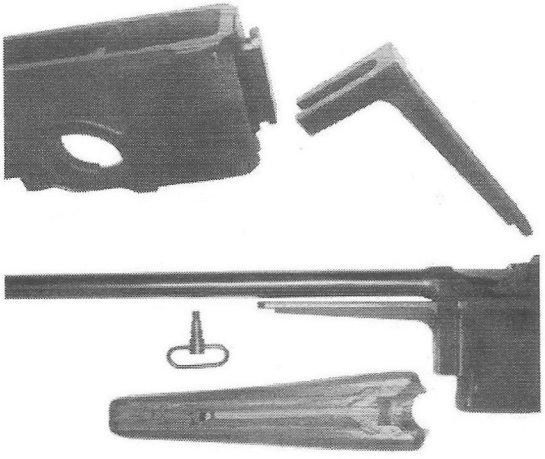
After the Mauser 1896 pistol debuted in the market, it was customary at the time for Mauser to come out with an extended barrel, fixed stock carbine on the same frame. The barrel length ranged from 10" to 16".



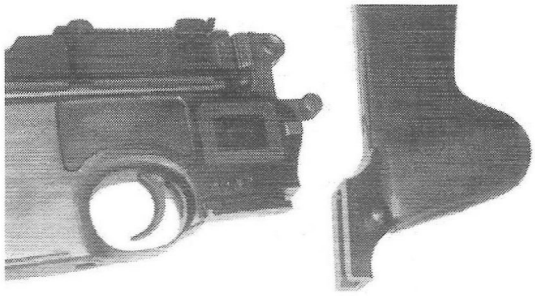
Picture 242 2 Mauser 1896 carbines from the Taku Naval Yard. The top one has the magazine missing and the one below has a 20 round box magazine. Beijing Military Museum.



Picture 243 The right side marking on a Taku 1896 – Taku Naval Yard. Source G.



Picture 244 The front hand guard fixture for the Mauser 1896 Carbine.



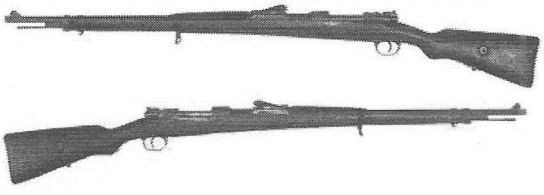
Picture 245 The attachment mechanism of the Mauser 1896 carbine butt stock.

The carbine was designed for cavalry, artillery and special services troops. With the stock and longer barrel, the Mauser 1896 Carbine did extend its effective range. However, the power of the 7.63x25mm cartridge was still far from a true rifle round and people soon realized that it was not a practical combat weapon. One advantage was that it was a semi-automatic weapon and so its fire power was arguably better than that of regular rifles. These pistols converted to carbines soon fell out of the favor. It is said that Mauser only produced less than a thousand of these carbines.

These were produced by various arsenals in China, notably Taku, but overall it wasn't a very important weapon.

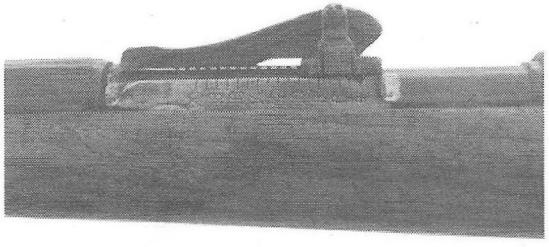
Section 3. Imported Rifles

I. German Mauser 1898 Rifle



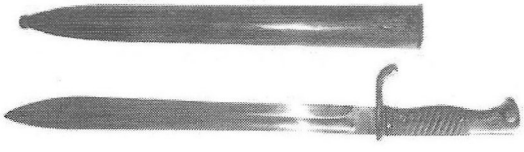
Mauser 1898 Rifle Specifications
Operation Method: Manual Turn Bolt
O/A Length：1,255mm
Barrel Length：646mm
Caliber：7.92x57mm
Weight：4.08kg
Muzzle Velocity：859m/s
Feed：5-shot internal magazine

Paul Mauser encountered a major setback when the German Commission adopted the 1888 rifle without even consulting him. He continued to work on his design and won numerous foreign contracts in the 1890s. Finally the German Army adopted his 1898 design as the Gewehr 98. It was considered the ultimate military bolt action rifle by many - there was nothing that could be done to improve on it.



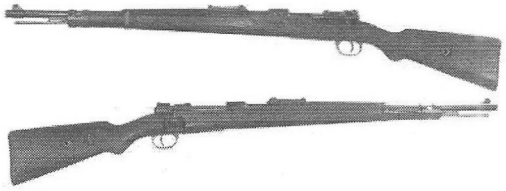
Picture 246 The rear sight of the Gew 98, often called a ski jump or roller coaster sight by some due to its shape.

After WWI, Germany was under severe restrictions by the Versailles Treaty. The German Army was limited to one hundred thousand men. Many surplus arms were offered in the international market. Some Gew 98 found their way to China and became the arms of the warlords.



Picture 247 One type of bayonet used with the 1898. It's often called the "butcher bayonet" due to its shape.

II. German Mauser K98k Rifle



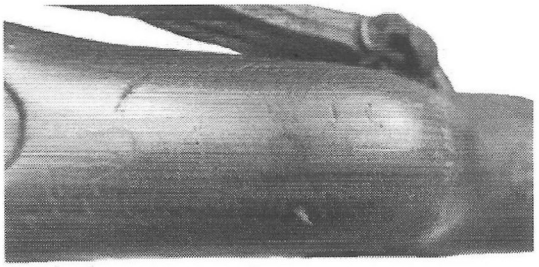
Picture 248 One of the K98k rifles sold to China between 1938 and 1939.

Mauser K98k Rifle Specification
Operation Method: Manual Turn Bolt
O/A Length：1,110mm
Barrel Length：600mm
Caliber：7.92x57mm
Weight：3.9kg
Muzzle Velocity：845m/s
Feed：5-shot internal magazine

"The German Foreign Minister had said he would be more than happy to stop all arms shipment to China in the first meeting with Lord Mushanokoji after the Peiping Incident", the Japanese Consulate continued: "We have credible information that there is a large shipment of war materials currently en route to China. There are seven ships in transit and three or more are about to embark. ..."

July 22, 1937, Berlin, Memo from Ernst von Weizaecker

Picture 249 A K98k shipped to China with the Nationalist Star marked on the receiver and barrel.



Picture 250 These rifles also have the star imprinted on the stock in multiple places.

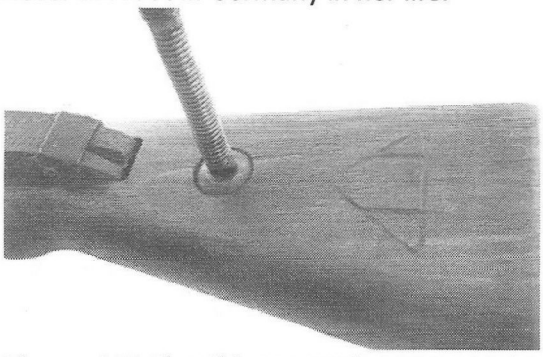
After the WWI, Germany was under the restrictions of Versailles Treaty but continued its effort on arms development. The Model 1924 was completed by Mauser and with continued effort it became the Karabiner 98 kurz in 1935. There were approximately 14 million of the K98k built.

Before the full scale Sino-Japanese conflicts erupted, Japan was already putting pressure on the German government to try to stop arms sales to China. It argued that it was an act violating Germany's neutral stand. Finally, Hitler recalled all advisers and ceased or cancelled all arms trades with China in 1938.

The Chinese procurement agents in Germany continued to try under adverse conditions to secure more arms. The German were actively rearming themselves at the time so even without the diplomatic complication, the supply was somewhat limited. The new batches were assembled from new and rejected parts. Some of them had the German proof marks or acceptance marks ground off.

This wasn't necessarily an unethical business practice on Mauser's part, it was probably the only way to get some rifles to China. People involved must have been fully aware of the situation and took them anyway. The heavy fighting and casualties in the beginning of the war along with the fact that most arsenals were on the move made for a desperate situation.

These were the last armament shipments from Germany to China during the war. There was a story that Madam Chiang visited Germany and personally ordered these rifles. Madam Chiang's travels, as the first lady of China, is pretty much in the public domain, By examining her record one would find that she never set foot in Germany in her life.[25]



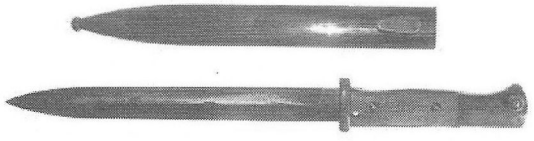
Picture 251 The Chinese K98k are stocked with laminated wood and complete with firing pin take-down disc.

These rifles were made after the K98k was adopted so they all have the identical configuration of the K98k, and different from the Standard Modell purchased earlier.

Between 1938 and 1939, there were 100,310 of such rifles delivered via Hong Kong and later Rangoon. The May 1939 batch contained 49,960 rifles and was recorded as Type 1937 on the manifest, it was probably because the receiver was marked as 1937 instead of Mauser.[26]

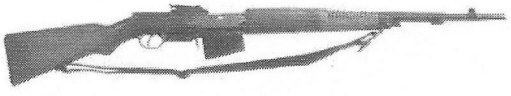
『...5,000 Mauser rifles, under the disguise of Finland procurement, loaded in Hansrickmer, Hamburg, on July 2 and designated for Hong Kong. It was to arrive on August 20. The manifest showed that the ship also contained 37,000,000 cartridges, auto parts and sea mines from Hapro contracts. The payment was not paid to the original manufacturers; it went through the company in Finland. This kind of transaction was strictly forbidden by the German government and the manufacturers would deny any involvement in such transactions if discovered. We heard that this was secretly approved by Goering,...it is going to be difficult going forward. If anything should happen to these cargos, there won't be any recourse because the German Government has strictly banned all armament shipments to China....』 [27]

Tang Boyu (譚伯羽) to Kong Xiangxi (孔祥熙), Berlin, July 8, 1938



Picture 252 The 84/98 bayonet that accompanied the K98k rifle.

III. Czechoslovakia ZH-29 Semi-automatic Rifles



Picture 253 ZH-29. Robert W. Faris collection.

ZH-29 Rifle Specification

Operation Method：Gas Operated
O/A Length：1,156mm
Barrel Length：738mm
Caliber：7.92x57mm
Weight：4.54kg

---

[25] However, there was another possibility. Her older sister Soong Eling (宋靄齡), wife of then Minister of Finance Kong Xiangxi (孔祥熙), was in Germany in 1937. Mr. Kong was on a trip to Britain as China's special envoy to the coronation of King George the VI on May 12, 1937. His other mission was to secure loans and procure weapons in Europe. He was in Germany in early June for seven days and visited several ordnance companies. His wife was with him on this trip. Could it be her that von Lossnitze saw?"

[26] Rifle Imports for China 1933 - 1941, Stanley J Zielinski,

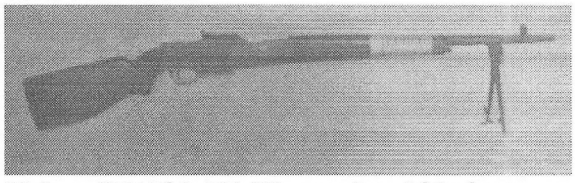
[27] Wartime Diplomacy, Vol. 2, p. 712

Muzzle Velocity：808m/s
Feed：10/20 round box magazine

China purchased 210 ZH-29 in 1930 and 1931 from Czechoslovakia. They were believed to be for the Northeastern Three Province authority. There is a photo of soldiers armed with ZH-29s in Edgar Snow's "Far Eastern Front".[28]

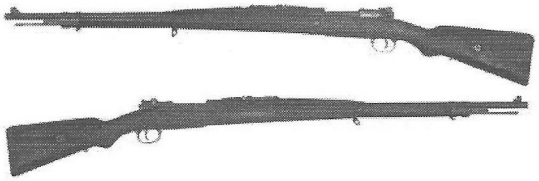
The Northeastern Three Province Arsenal records showed that a locally produced semi-automatic rifle was successfully tested and ready for production right before the "918 Incident." Later the Arsenal fell into Japanese hands and no further information is known.

Picture 254 The Japanese experimental semi-automatic rifle discovered in Japan after WWII. According to Fred Honeycutt, it was made by Tokyo Electric for the Army 1932 trials. The design was based on the ZH-29 captured in Manchuria. Robert W. Faris collection.



Picture 255 This ZH-29 copy is said to have come from the arsenal of the Nanking Puppet regime.[29]

IV. Czechoslovakia Vz-98/22 Rifle



Vz-98/22 Rifle Specification
Operation Method: Manual Turn Bolt
O/A Length：1,244mm
Barrel Length：724mm
Caliber：7.92x57mm
Weight：3.85kg
Muzzle Velocity：870m/s
Feed：5-shot internal magazine

The Ceskoslovernska Zbrojovka Akciova Spolecnost v Brno was set up in 1917 with machinery purchased from Mauser. The objective was to produce Mauser 1898 rifles. Brno soon became a major armament supplier to the world. In the 1920s, the Germans could no longer export arms and Brno quickly filled the void.

The first model of rifle Brno offered for export in large quantity was the Vz-98/22. This was a modified Mauser 1898.

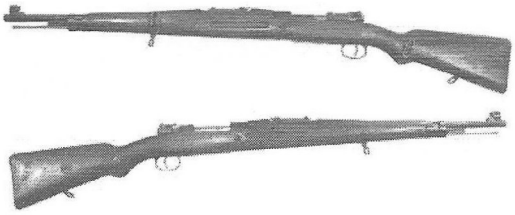
Czech records show that they shipped ,200 rifles to China between 1927 and 1939.[30] Of these, 69,000 were shipped prior to 1930 wut model designation. There should be a 30,000 contract by the Northeasterwas also Three Province authority. The Young Marshall's Australian advisor W. H. Donald obtained a manifest and showed it to Zhang Xueliang, they were purchased by Zhang Yinhuai (常蔭槐) and Yang Yuting (楊宇霆) without his knowledge. This resulted in the execution of the two by Zhang.

---

[28] Far Eastern Front, p.65, Edgar Snow, 1934.
[29] Guns (槍械), Ordnance Research Office, The Third Field Corp. of Eastern China, August, 1952.

[30] The history of the Brno factory , "Zbrane Pro Cely Svet", Appendix

V. Czechoslovakia Vz-24 Rifle



Vz-24 Rifle Specification
Operation Method: Manual Turn Bolt
O/A Length：1,110mm
Barrel Length：590mm
Caliber：7.92x57mm
Weight：4.08kg
Muzzle Velocity：810m/s
Feed：5-shot internal magazine

Right after the Vz-98/22, Brno started making a short rifle designated as the Vz-24. This became the standard issue of the new Czech Army. At the same time, it was offered in the world market. Some people consider the Vz-24 as one of the finest Mauser rifles ever made. Other than good workmanship, the steel came from Skoda and was of the best quality. The design however still stemmed from German experience in WWI.

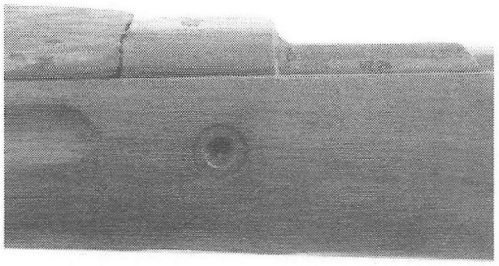
『The telegram from the Generalissimo was received to obtain quotes for 20,000 to 30,000 German or Czech rifles. The German rifle costs 55 Gold Marks, it is cheaper than the Czech Rifle by 2.2 Yuan. Also, the Czech rifles were never used by our Troops so they need to be evaluated by the Ordnance Office. There is no order placed yet.』

March 12, 1934, Li Yaohuang (李耀煌) telegram to Chiang Kai-Shek

It is interesting to note that China did purchase 99,997 Vz-24 between 1937 and 1938.[31] By examining the timing, these rifles were not all delivered when Germany invaded Czechoslovakia. Germany apparently allowed Brno to complete the contract. Most collectors believe that these rifles all had "P" prefix serial numbers.

The General Staff of the 29th Route Army Zhang Yueting (張樾亭) recalled that they also purchased 10,000 Czech rifles in 1936.

The major appearance differences of the Vz-24 is that it has a full length hand guard extending from the rear sight to the front band and a two-way sling swivels which allow attaching the sling on the side or on the bottom, making it adaptable to either infantry or cavalry.

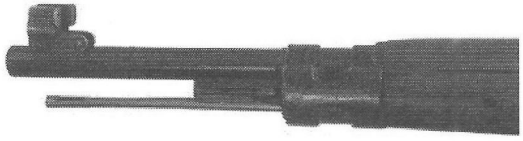


Picture 256 The recoil lug of the Vz-24 has an indent on one end which is intended to be used in firing pin disassembly.

All Vz-24 rifles have a circular steel plate on the butt stock. It was an old European tradition to mark on this disk the unit to which the rifle was issued and any other data relevant to the rifle. The front band was secured by a band spring and a special screw secured the rear band.

[31] Rifle Imports for China 1933 – 1941, Stanley J Zielinski

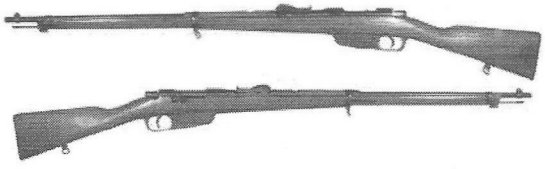
Picture 257 The Vz-24 sling swivel configuration. The sling can be attached either on the side or on the bottom.



Picture 258 The Vz-24 has a removable sight protector. It can be easily removed or attached. This Vz-24 has the proper cleaning rod.

Picture 259 August 27, 1937, Japanese personnel examine captured weapons from the 29th Route Army. Note the three Vz-24s on the right. Source A.

VI. Italian 1891 Carcano Rifle

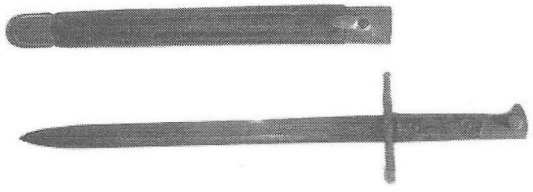


1891 Rifle Specifications
Operation Method: Manual Turn Bolt
O/A Length：1,289mm
Barrel Length：781mm
Caliber：6.5x52mm
Weight：3.81kg
Muzzle Velocity：730m/s
Feed：6-shot protruding fixed magazine
When smokeless gunpowder first appeared in 1888, all powers in Europe rushed to adopt smokeless, small caliber cartridge rifles. Italy formed a Small Arms Committee under the Central Infantry School in 1888 to explore the possibility for a new standard rifle.

In the following three years, the Committee tested a dozen different rifles, including the German 1888. The final winner was a design from Salvatore Carcano of the Torino Arsenal. It was adopted as the Fucile di Fanteria Modello 1891 – Infantry Rifle, Model 1891. This remained the standard issue for the Italian Army through WWI and WWII. There were some modifications and a short rifle version as well as a carbine version were produced but the action remained the same.

The earliest Chinese record of Carcano usage was in 1920 when China's Army Department agreed to purchase 40,000 rifles from an Italian merchant (柯紐良). In 1922,[32] Cao Kun (曹錕)[33] ordered Zhao Yuke (趙玉珂) to sign a contract to purchase 14,000 Italian rifles. In 1924, China's Army Department purchased the entire cargo on board the "Ship of Japan" (日本號), which belonged to Zheng Zheluo (鄭者羅). This cargo contained 40,000 Model 1891 Carcano rifles.[34]

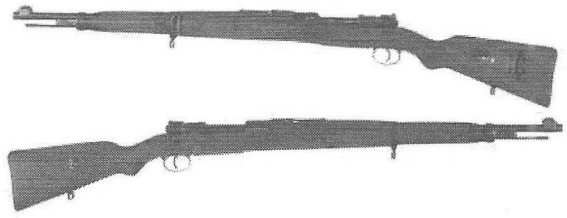
From the Japanese records of captured Chinese weapons, the Carcanos were encountered most of them from troops in Fujian province (福建). Some of these might have been purchased later as part of an Italian program trying to establish a Chinese Air Force prior to the war.



Picture 260 The bayonet for the Model 1891.

[32] Reference 2, Vol. 2, p. 491
[33] Reference 2, Vol. 2, p. 494
[34] Reference 2, Vol. 2, p. 496

VII. Polish K-29/Wz-29 Rifle



Wz-29 Rifle Specifications
Operation Method: Manual Turn Bolt
O/A Length：1,095mm
Barrel Length：600mm
Caliber：7.92x57mm
Weight：3.85kg
Muzzle Velocity：845m/s
Feed：5-shot fixed magazine

Poland was partitioned by the surrounding powers in the 19th Century and didn't become an independent state until 1919. After its independence, it started a serious rearming effort. Due to historical reasons, Poland was in possession of a large number of various weapons left behind by the previously occupying powers. Eventually, Poland decided on the Mauser design as the standard rifle. A model similar to the Mauser 1898 was introduced in 1922. In 1929, a model based on the Mauser Kar 98a was introduced as the Karabinek Wzor 1929 or K-29. Production started in 1930 in F.B. Radom. The carbine designation was deleted in 1933 and it was called simply the Wzor 29 or Wz-29.

In 1926, the Polish government established the "Polish Military Export Company" or "SEPEWE" to export Polish military equipment to the international market. It also broker military equipment to earn gold deposit.

When Spain entered the civil war, both sides not only had their foreign allies support but also procured large quantity of armament from the international market themselves. The K-29/Wz-29 was one of these. The Poles ground off the markings and sold large quantities to Spain.

At the same time, China was also actively arming itself and procuring arms from the international market. Some of these entered China. Due to the small production total– estimated around 260,000 rifles, it could not have been a large amount that entered China. (See Appendix 5: Japanese captured small arms data.)

Germany later occupied Poland and most of the rifles were reused and lost in the war. The Spanish government exported the remaining small arms from the civil war period to the US in 1956, the existing Wz-29 were mostly from that group of rifles.

The K-29/Wz-29 was still mainly a Mauser design with small modifications. It had a solid front sight protector, long upper hand guard and side mounted or bottom mounted sling. The most notable feature was that all stocks have the bolt handle indent but only the cavalry rifle used a bent bolt.

Section 4. Other Sources

I. The Russian War Loan and Military Equipment Acquisition

On August 1, 1926, China and the Soviet Union signed a "Non-Aggression Treaty" in Nanking. The effective period was five years. In the treaty, the Soviet Union agreed to provide economic and military aid.

China sent Vice Chief of General Staff Yang Jie (楊杰) of the National Military Committee along with 18 other high ranking officials under the guise of the "Russian Industrial Affairs Inspection Committee of the Industry Ministry" (工業部赴蘇實業考察委員會) to

the Soviet Union to procure military equipment.[35]

There were three loans signed between 1938 and 1939 under this treaty. The first one was fifty million US dollars signed on March 1, 1938. The second one was fifty million dollars signed August 11, 1938. The third one was a hundred fifty million US dollars signed on June 13, 1939. The three loans totaled two hundred fifty million US dollars. The loans were used to purchase airplanes, tanks, artillery pieces, small arms and other military equipment. The annual interest was 0.3% and the payment period was five to ten years. China would pay the debt by trading agricultural produce, mineral ore and furs. In June 1941, Germany invaded Soviet Union. The third loan was interrupted and the net borrowing was a hundred seventy million US dollars.

Picture 261 A Soviet M-1935 76mm anti-aircraft gun inspected by Chinese and US personnel after the war.

The transportation of the procured equipment was divided into three routes: 1. The overland route started out from Alma-Ata, via Hami (哈密), Anxi (安西), Suzhou (肃州) to Lanzhou (蘭州) The distance traveled was 3,000 kilometers. There were twenty four service centers set up along the route to provide lodging and food for the Russian drivers. 2. The air route also started out from Alma-Ata, via Lanzhou to Hankow. 3. The sea route started out from Odessa Harbor in the Ukraine, via Dardanelles Strait, Suez Canal, Red Sea, Indian Ocean to Guangzhou or Hong Kong.

Picture 262 Russian T-26s on National Day parade, notice the sun emblem on the front of the tanks. Source A.

China provided 14 different kinds of raw materials to the Soviet Union as payment, including tea, fur, antimony, tin, silk, cotton, herbs, tungsten, and mercury. All debts except for some disputed items were paid in full before the end of the war.

In addition to the sales of military equipment, the Soviet Union also sent military advisors and active combatants to China. The total amounted to over 5000. There were over 200 Russian pilots killed in action in China. Their burial sites in Hankow still exist today.

In retrospect, the Soviet Union provided aid when China needed it the most. The military personnel offered their most selfless support. They were not paid in gold like the "Flying Tigers," and their deaths were not even recognized by their country. For various political reasons, this page of history was deeply buried by all parties.

[35] Sino-Japanese War History Series – The alliance in turmoil – Russo-China relationship during the war.

Small Arms Procured from the Soviet Union				
Item	Quantity	Dollar Amount (US)		Note
		Unit	Total	
DP light machine gun	3,000			DP26
DP light machine gun	500	$225.00	$112,500.00	DP26
DP light machine gun	600	$225.00	$135,000.00	DP26
DP light machine gun	1,500	$225.00	$337,500.00	DP26
PPD-34/38	1,300			PPD-34/38
Machine gun cartridges	10,000,000	$25.0 (per 1,000)	$250,000.00	
Rifle	50,000			
Rifle cartridges	10,000,000	$25.0 (per 1,000)	$250,000.00	
Rifle cartridges	20,360,000	$25.0 (per 1,000)	$509,000.00	
Rifle cartridges	10,000,000			
Maxim Machine gun	300	$600.00	$180,000.00	1910 Sokolov Maxim
Maxim Machine gun	1,000			1910 Sokolov Maxim
Maxim-Tokarev Machine gun	400			1925 Maxim-Tokarev
Maxim-Tokarev Machine gun	500	$180.00	$90,000.00	1925 Maxim-Tokarev
Maxim-Tokarev Machine gun	500	$180.00	$90,000.00	1925 Maxim-Tokarev

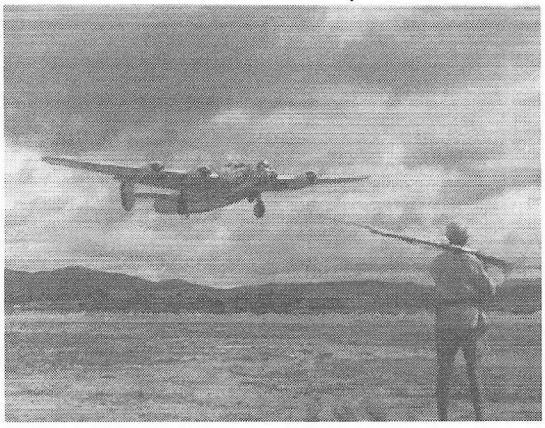
A. Russian Mosin-Nagant 1891、1891/30 series Rifles

Picture 263 Top: Mosin-Nagant M1891, below: Mosin-Nagant M91/30, note the difference of the rear sight configuration and the way the hand guards are secured.

1891 Rifle Specifications
Operation Method: Manual Turn Bolt
O/A Length：1,235mm
Barrel Length：800mm
Caliber：7.62x54mmR
Weight：4.1kg
Muzzle Velocity：731m/s
Feed：5-shot protruding fixed magazine

The Mosin-Nagant Model 1891 was the rifle standardized by Imperial Russia in 1891 as Vintovka Oraztsa 1891 Goda. The designers were Sergei Ivanovich Mosin, who was a Russian, and Leon Nagant, who was from Belgium. During the trial process, the rifles designed by both of them passed. The final result was the combination of the action by Mosin and the magazine system by Nagant.

The Mosin-Nagant was first produced in France. Production in Russia started in Izhevsk and Tula in 1894. When production ceased in 1948, a total of 17 million had been produced. During WWI, Russian also contracted with Remington and Westinghouse in the US to produce one million Mosin-Nagant rifles. However, due to financial problems most of those rifles weren't delivered and the two companies almost went into receivership because of it.

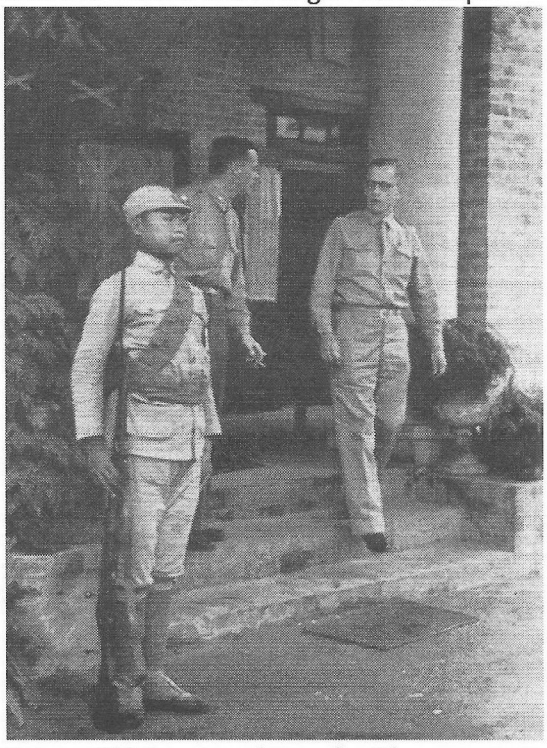


Picture 264 An airport sentry with a Mosin-Nagant rifle on his shoulder during the war. The spike bayonet can be clearly seen.

The Mosin-Nagant is not a stranger to the Chinese. It's called "Three-line rifle" (三線步槍) or "Water-repeater" (水連珠). The three-line name was obviously from the old Russian measurement of the caliber, while the term "water-repeater" is believed to stem from the fact that the Chinese first encountered this rifle being used by Imperial Russian naval troops, hence the name.

When the Huang Pu Academy was first established, Russia sent some 22,000 1891 rifles to support the struggle. The Northwest Army during the Northward Expedition and the troops in Xinjiang (新疆) under Cheng Shicai (盛世才) were all equipped with large quantities of Mosin-Nagant rifles due to their proximity with Russia.

The Russian Aid Program in the beginning of the war also provided 50,000 rifles. The 7.62x54R cartridge supply obviously was a problem. These rifles probably were only issued to second line and garrison troops.



Picture 265 An armed guard with a Mosin-Nagant rifle posted in front of General Stilwell's office in Maymyo, Burma, 1942.

Picture 266 The spike bayonet used by Mosin-Nagant rifles.

II. US Lend Lease Act

On March 11, 1941, the US Congress passed the "Lend Lease Act" to "Promote the Defense of the United States." The total value originally appropriated was 1.3 billion dollars. This act authorized the Executive Branch to provide necessary war materials to allied nations as long as it didn't conflict with US interests.

China formed the "China Defense and Supply Inc." (C.D.S.) in the US to handle all Lend-Lease matters under the direction of Song Ziwen (宋子文). All war material procurement during the war was paid for under the fund managed by the Office of Lend-Lease Administration. The Chinese representatives in Washington D.C. were responsible for reporting back to Chungking on what items were available and then take the orders from Chungking to the Defense Ministry to obtain approvals. The State Department would then issue export licenses and arrange payment from the appropriated funds.

All equipment, weapons and other materials remained US Government property and were marked accordingly. This was to indicate that these materials were on loan to the designated countries. There was however no known example that the US recalled the Lend-Lease materials. A few countries did return some of the goods but they were in a worn condition and more money had to be spent to dispose of them. In fact, there was an act of Congress in the 1950s to forbid the Lend-Lease materials from returning to the US due to the fear that these surplus materials might flood the market and cause economic problems.

Due to the closure of the Burma road, the US Army Air Force started air-lift operations from India to China in April, 1942. The tonnage was 300 tons a month and gradually rose to more than 70 thousand tons by mid-1945.

Many people thought that the US supply would greatly improve the war supply situation in China. However, the material that actually reached Chinese troops was very little. The simple fact was that all the planes that flew over the Hump had to go back. The fuel for the return trip had to be flown in as well. The more they flew, the more fuel needed to be flown in.

Also, the 14th Air Force operating in China needed to fly in all their fuel, munitions and spare parts. This took a big chunk out of the monthly tonnage. In 1944, the B-29s started bombing Japan from India. They all landed in China for re-fueling. The B-29 took literally tons of fuel on each re-fueling. The shortage of supply even caused great in-fighting among various US units operating in China. SACO, OSS, the 14th Air Force and General Stilwell's forces were all fighting for the same resources. The Chinese combat troops' requirements were much lower priority compared to these competing priorities. There is more research needed on this subject to clear up the myth about how Chinese were receiving all the US supplies but were still badly defeated during the Japanese Ichiban campaign later in the war.

There were 30 some countries qualified for aid under the Lend-Lease Act. At the end of the war, the total appropriated was 48.5 billion dollars. 30.9 billion went to Great Britain, 11 billion went to the Soviet Union, and China only received eighty seven million, which was only 1.8% of the total. On the other hand, the French government in exile received 2.8 billion.[36]

"Ordnance Office Representative at Dibrugarh (狄不魯加), India. Telegram D 3601.
To: The Eastern Office of the Transportation Ministry
This Office urgently needs the ordnance material that has arrived at Dibrugarh. There are over seven thousand tons of most urgently needed materials and over thirty thousand tons in total.
Some of the materials are included in the US "Yoke" tonnage but it is limited. The war materials for each war zone can only be

[36] Military Aids to China During the War, Wang Zhenghua (王正華), Huanqiu Press, 1987, p. 307.

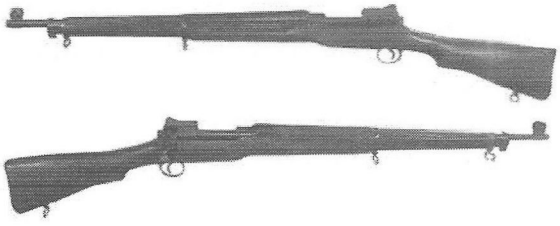
shipped via CNAC (China National Aviation Corporation).
The inability of shipping materials from Dibrugarh has forced several arsenals to stop production. Please report this situation to the "Wartime Production Bureau" to increase our tonnage.

Wei Weiheng (魏惟恒), Ordnance Office Representative"

Telegram from Transportation Ministry to the Wartime Production Bureau, January 15, 1945.

This telegram told the story of how little the air-lift helped China's war effort. These were ordnance materials but they couldn't even get on the air-lift into China.

A. US M1917 Rifle

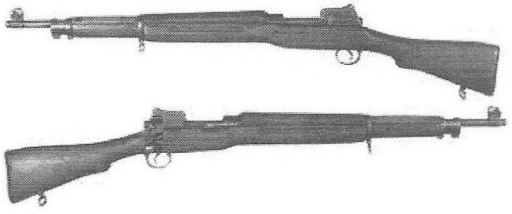


M1917 Rifle Specifications
Operation Method: Manual Turn Bolt
O/A Length：1,170mm
Barrel Length：660.4mm
Caliber：7.62x63mm
Weight：4.17kg
Muzzle Velocity：853m/s
Feed：5-shot internal magazine

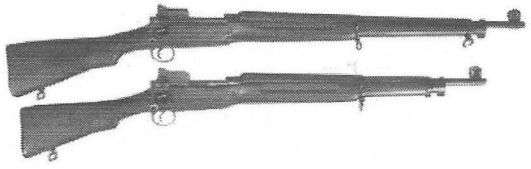
This was a British design adopted in 1914 and generally referred to as the P14. The British government contracted with Remington and Winchester to manufacture these rifles at the beginning of WWI. When the US entered the war, it was badly short of arms. There was not enough production capacity to produce the standard M1903 rifle even with gearing up Springfield and Rock Island Arsenals for war production. The decision was made to re-chamber the P14 to 30-06 and utilize the existing production capacity to fulfill the needs. The new rifle was designated as US Rifle, Caliber .30, Model of 1917.

The 1917 rifles in US services during WWI far out-numbered the 1903. After the Armistice, some suggested adopting the 1917 as the standard issue arm. It was rejected probably because it was not designed in the US and the rear sight didn't have windage adjustment. All 1917s were put into storage.

Following Pearl Harbor, the US again found itself short of arms so the 1917s were taken out of storage and re-issued to troops. For the most part it was issued to domestic security details, training camps, and aid to allies..



Picture 267 The 1917 with a shortened barrel and stock as modified in India for Chinese troops.

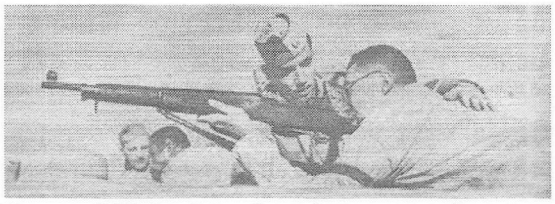


Picture 268 A comparison between an original and shortened M1917 rifles.

The X Forces in India were the primary Chinese troops receiving the US 1917 rifles. There were also requests to shorten the barrel to suit the smaller stature Chinese soldiers. There is a dispute about who made the request – Chinese or US military personnel. Some were issued without alteration and some were altered.

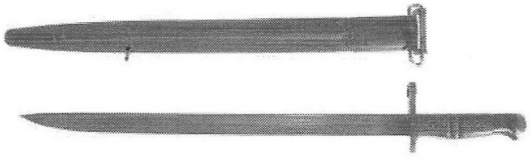
Based on a TO&E report of the New First Army, in December, 1943, the Army HQ had 1,783 M1917, the 38th Division 4,494 M1917, the 22nd Division 3,370 M1917 and 391

M1917 rifles had not been issued. These 1917 rifles followed these troops through the Burma campaign, the Chinese Civil war and some even ended up being used in the Korean War.



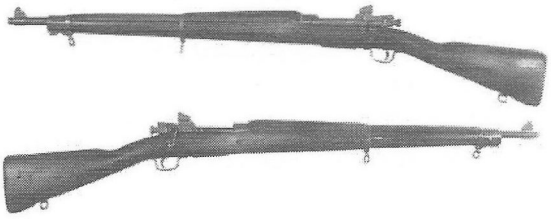
Picture 269 An American instructor showing a Chinese Colonel how to shoot the M1917 rifle. Note that the rifle is the shortened version. From "Ramgarh – Now it can be told", US Army publication.

Picture 270 Two X-forces soldiers meet a Y-forces soldier at Mong-Yu (芒友), Burma. Note that the soldier in the middle is armed with a shortened M1917. Source A.



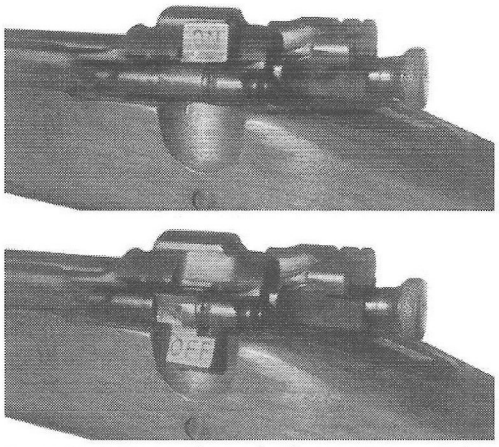
Picture 271 Bayonet M1917 for the M1917 rifle. It is the British P1913 adopted along with the M1917 rifle by the US.

B. US 1903A3 Rifle

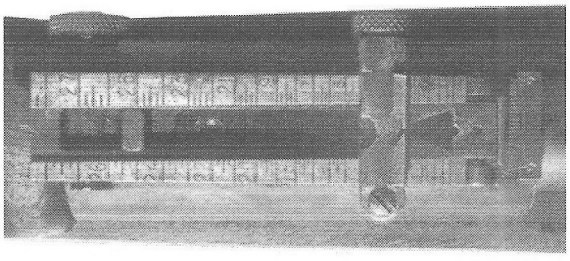


1903A3 Rifle Specifications
Operation Method: Manual Turn Bolt
O/A Length：1,098mm
Barrel Length：609.6mm
Caliber：7.62x63mm
Weight：3.94kg
Muzzle Velocity：853m/s
Feed：5-shot internal magazine

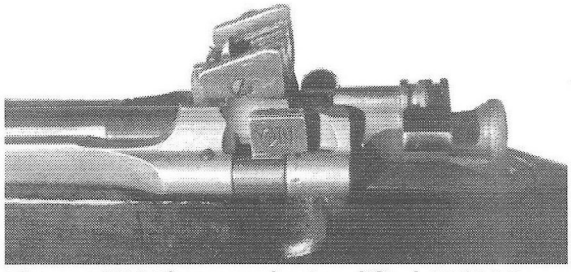
The 1903 was called "Springfield 30 caliber"(春田三〇步槍) or "Floral Flag Zhong Zheng"(花旗中正) by the Chinese. (Floral Flag refers to the Stars & Stripes of the US National Flag. The term is still in use today such as Ginsengs from Wisconsin are called 'Floral Flag Ginseng' as opposed to Ginsengs from China or Korea. As far as Zhong Zheng, the only similarity between ZZS and M1903 is probably the fact that they're both bolt action rifles.) The US Army adopted it in 1903. It is also based on the Mauser 98 action. There were patent disputes raised by Mauser and the US had to pay Mauser royalties. When WWI came, the issue was just forgotten. The rifle was in service from 1903 to the 1950s in the US military. When WWII broke out, the US Government turned to Remington and Smith-Corona to produce more 1903s to supplement the M1 Garand rifles.



Picture 272 Even though the 1903 was the world's first general issue short rifle, it had the outdated magazine cut-off feature. Authorities were afraid that soldiers would waste ammo with a repeater and the solution was to introduce a cut-off device. When the enemy was still far away, soldiers were to use the rifle as a single shot. In practice, it is doubtful that soldiers would follow that discipline. Below, the cut off is engaged and it limits the travel of the bolt so it cannot feed the cartridges in the magazine.



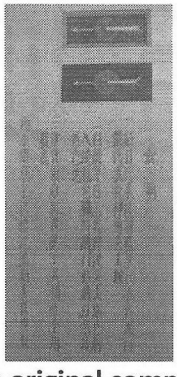
Picture 273 The rear sight of a 1903A1. Note the windage adjustment knob in the upper left hand corner of the picture.



Picture 274 The greatly simplified 1903A3 rear sight. It was moved to the end of the receiver to increase the line of sight.

China received some 1903 rifles via the Office of Strategic Services (OSS). These rifles were supplied to the newly formed commando units. (Later changed to paratroopers.) The 1903 wasn't any better than the Zhong Zheng Shi rifle but for the commandos it had the advantage of sharing the same 30-06 cartridges as the BARs and 1919 machine guns they also used.

Picture 275 A unit guarding a Bank of China location in the mountains near Kunming. Note that they are all armed with the M1903. These probably were security forces belonging to China's Finance Ministry. Picture by Wayne Helfrich, Pennsylvania, in 1891 Aviation Battalion of the 14th Air Forces.

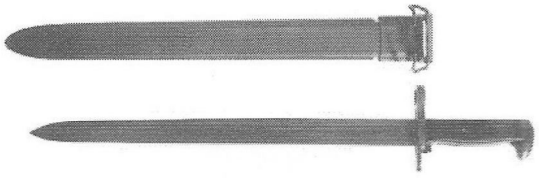


Picture 276 The original commando insignia design document. It symbolized that the troopers were the sharp arrows to shoot through the red sun (Japan) – following the line of the Chinese folktale that the hero shot down 9 out of 10 Suns to save the mankind. Source A.

The paratroop unit was first formed in 1943. It was organized by the Commander of the 5th Group Army Du Yuming (杜聿明). It started with the Special Services Battalion of the 5th Army, setting up base in Yong Feng Si (永豐寺), Gang Tou Cun (崗頭村), Kunming, in 1944 as the First Paratroop Regiment.

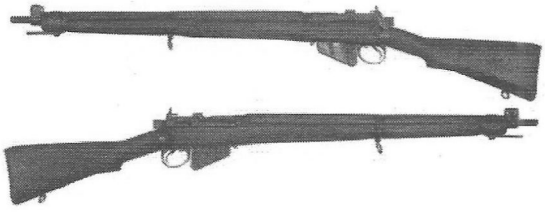
In January, 1945, the paratrooper unit was re-organized into commando units per the suggestion of the American Advisor, Lt. Colonel Cox (柯克斯). The OSS provided the equipment and started parachute training at Bei Xiao Chang Airport (北校場), Cheng Gong county (呈貢).

Each unit was divided into six branches, three of which were rifle branches, similar to a platoon. Each branch had two infantry squads. Each squad consisted of one officer and eleven enlisted men with ten 1903 rifles (one with a grenade launcher), one BAR, one carbine and two 1911 pistols. The other branches were a 60mm mortar branch, a 30 caliber HMG branch and a demolition branch.



Picture 277 The 1905/42 bayonet for the M1903. It can be used with the M1 Garand as well.

C. US Savage produced Lee-Enfield SMLE No. 4 Mk 1* Rifle



Lee-Enfield SMLE No. 4 Mk 1* Rifle Specifications

Operation Method: Manual Turn Bolt

O/A Length：1,129mm
Barrel Length：641mm
Caliber：7.7x56mmR
Weight：4.1kg
Muzzle Velocity：744m/s
Feed：10-shot box magazine

The Lee-Enfield rifle was originally designed by an American, James Paris Lee, in the early 1880s. His greatest contribution to the ordnance design as a whole was the invention of the removable box magazine. His early designs were produced in the US but weren't widely adopted by the military.

China procured some 9,000 Model 1882 rifles of his design from Remington in 1884. The receiver was marked "Made by Remington and imported by Buchheister and Company" in Chinese. In addition, some 4,000 Model 1879 were also purchased and re-chambered to the same caliber. These guns were used in the Sino-French war of 1885 in the border region of China and Vietnam. In three days of battle, the French troops suffered 463 casualties – amounting to 20% of its total strength. The French troops withdrew into Vietnam with the Chinese troops in hot pursuit all the way to Lạng Son (諒山). In the postmortem report, the French stated that most of the French troops were using single shot rifles. Some had the tube fed rifle but it took a long time to reload after the tube magazine was empty. The Qing troops, on the other hand, were all armed with Lee rifles. These had a large magazine capacity and were much easier to reload. In other words, it was the sheer fire power of the Qing troops that defeated the French.

During that era, Lee magazine rifles were held to high regard and many of the gingal rifles were based on his design.

The Lee rifles were not very popular in the US but his design won the important British new rifle trials to replace the aging Martini rifle. It

was selected as the new British standard issue in 1888. The rifle was originally called the Lee-Metford due to the fact that the cartridge and rifling were of William Ellis Metford's design. The basic design remained in British service all the way into the 1950s. In addition to Britain, all the commonwealth member nations also adopted the same pattern. It remains one of the most proliferate rifle designs in history.

China lost connection with the Lee rifle after the Sino-French war until its Expeditionary Forces retreated into India in 1942.

At the end of the first failed Burma campaign, General Sun Liren (孫立人) disobeyed the order of his superior and led his retreating 38th Division into India instead of crossing the jungles of northern Burma back into China.

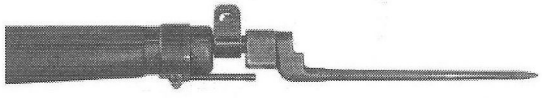
History would prove that General Sun was correct. His division arrived in India in surprisingly good shape with weapons and organization intact. On the other hand, the troops that went through northern Burma lost almost 50,000 men in the jungle (out of the 100,000 that entered Burma). However, General Sun also had to suffer the consequence of disobeying his superior. Years later, General Du Yuming (杜聿明) would become his superior again in Manchuria during the civil war. General Sun was squeezed out of his post in the end.

After the Chinese entered India, it was agreed that the British would supply lodging and food, American would supply equipment and Chinese would supply combatants. The objective was to train the Chinese to re-take Burma. An infantry training center was set up at Ramgarh, India.

In 1941, the British government had contracted with the Savage Arms Company in the US to manufacture the newest Lee-Enfield – the No. 4 Mk 1*. It was later included in the Lend-Lease Act so therefore all these rifles were marked US Property. There were over one million rifles produced by Savage by the time the contract was cancelled in 1944.

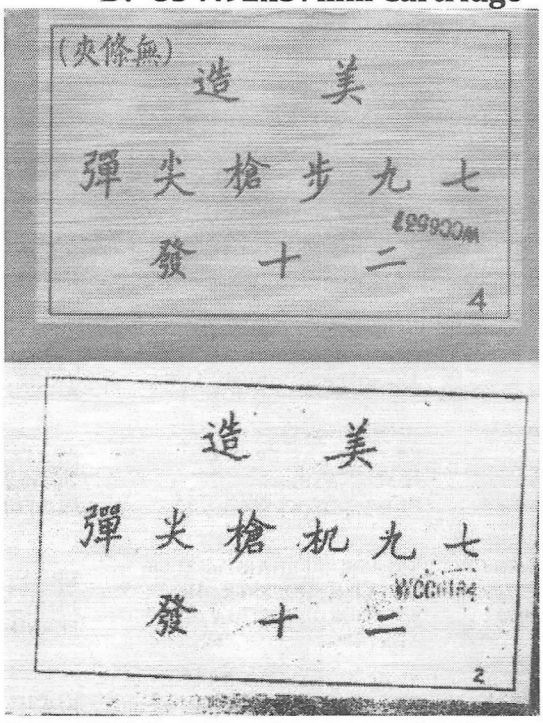
When Ramgarh was first set up, the rifles received were Lee-Enfields. The Expeditionary Forces later received American rifles but they kept the Lee-Enfield for guard duty, training, etc. Some of them followed the troops back into China at the conclusion of the second Burma campaign. Some of them even showed up in Taiwan at a much later date.

Picture 278 A Chinese soldier doing bayonet drill in Ramgarh. He appears to have full British gear. "Ramgarh – Now it can be told", US Army publication.



Picture 279 The spike bayonet of the No. 4 Mk 1* rifle.

D. US 7.92x57mm Cartridge

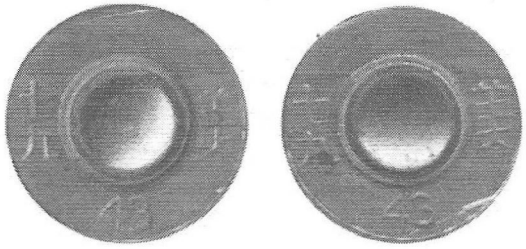


Picture 280 Cartridges box covers for the WCC cartridges. Top: for rifle, below: for machine gun.

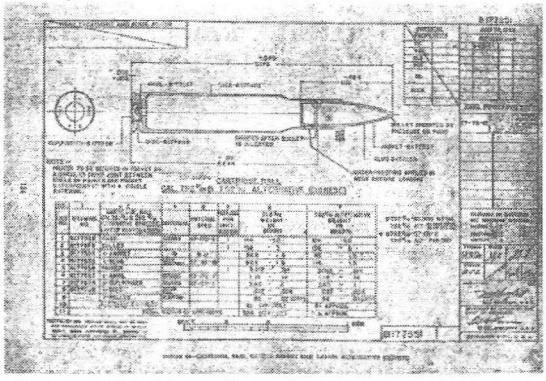
The 7.92mm cartridges supplied to China were produced by the Western Cartridge Company (WCC), located in East Alton, Illinois.

The cartridges Western supplied included both rifle and machine gun cartridges. There was no date but the year of production was stamped on the base of the cartridge in the 6 o'clock position. The Chinese numeric "79" was stamped in the 9 o'clock position and Mei (美) (for US) was stamped in the 3 o'clock position.

The known year stamps are 42, 43 and 44. The bullet was 153-156 grains (9.92-10.11 grams). There were also GM(Gilding Metal) and GMCS(Gilding Metal Clad Steel) configurations. The GMCS probably were used in the steel core armor piercing rounds.



Picture 281 WCC 7.92 cartridges with head stamp 43.



Picture 282 The original 7.92 cartridge technical specification of the Western Cartridges Company. Source C.

The primers were all boxer type and there was sealant around the primer, either green or red. Some of the sealant was applied in China after delivery. The cartridge cases were all made of brass.

There were also dummy rounds. Other than missing primers, these dummy cartridges look exactly like live rounds.

The WCC cartridge was weaker compared to the German round. After the war, the US Army used a batch of undelivered WCC 7.9 cartridges to test captured German weapons. It was found that WCC cartridges had more muzzle flash and smoke than the captured German rounds but were not as accurate in the MG-42 and G-43. The WCC cartridges also suffered from case splitting. The conclusion was that the WCC cartridges were not suited

for automatic weapons.[37] The reason is probably due to the fact that the WCC cartridge was still a commercial load and the loading was not up to the German military standards.

III. SACO – Sino America Cooperative Organization

Picture 283 The emblem used by SACO. The small pennant in the middle was a joke Admiral Miles played on the Japanese fleet before the war – it read "What the xxx...."

Rear Admiral Milton E. Miles was born in Jerome, Arizona. He graduated from the Naval Academy in 1922 and serve on board various ships in China between 1922 and 1939.

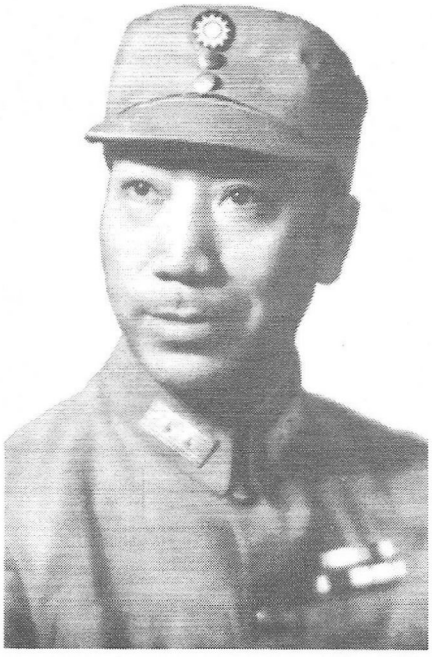
Picture 284 Rear Admiral Milton E. Miles.

In 1942, he was asked to go to China to find: "a suitable landing site in 3-4 years and in the interim, find any opportunity to assist the US Navy and harass Japanese troops."[38]

Miles spoke with the Chinese Military Attaché Colonel Xiao Bo (蕭勃) in Washington D.C., who happened to be a BIS (Bureau of Investigation and Statistics) operative. Miles was sent to see Lt General Dai Li (戴笠) – the head of BIS when he arrived in Chungking. This eventually led to the signing of the Sino America Cooperative Organization (SACO) agreement.

[37] p. 191, MG34-MG42, Folke Myrvang, Collector Grade Publications, 2002. P.O. Box 1046 Cobourg, Ontaria K9A 4W5, Canada

[38] A different kind of War, Milton E. Miles, p. 18, Doubleday & Company, Ic, Garden City, New York, 1967

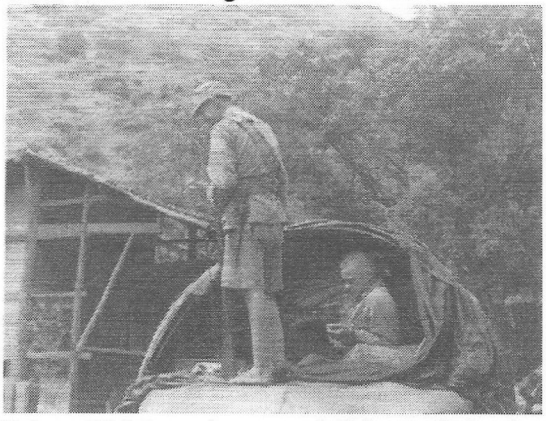


Picture 285 Lt General Dai Li, head of BIS

The agreement stated that the mission of SACO was to cooperate in matters against Japan/ Americans would train all Chinese personnel and supply arms and equipment, and the Chinese would supply the facilities, personnel and other logistical necessities. The other mission was to collect weather conditions in mainland China– the weather pattern in Pacific was mainly influenced by the Asia mainland. With this information the weather experts could accurately forecast the weather in the Pacific which would give the US Pacific Fleet an upper hand in fighting the Japanese navy. When the opportunity presented itself, SACO was to harass and interrupt Japanese supply lines in the rear.

SACO was the first unit in which American soldiers served with foreign military personnel side by side. During WWI, General Pershing refused to do so and insisted on US troops fighting as an independent unit.

SACO not only had a mixed organization, it also in theory put the Americans under Chinese command for Dai was the head of SACO. Due to the close relationship between Miles and Dai, it resulted in some serious political issues within US units in China. The pressure was so great thatMiles suffered a nervous breakdown and had to return to the US for treatment right after the war.

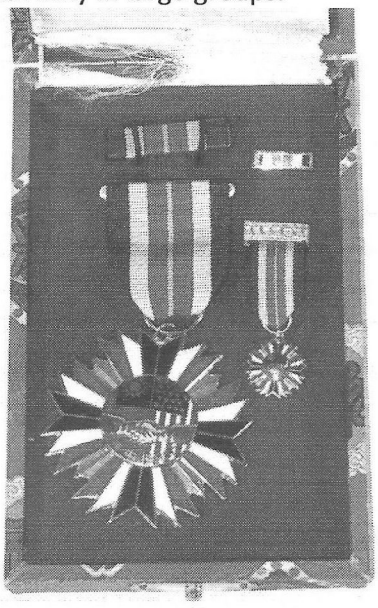


Picture 286 Americans and Chinese fight the war side by side. This was taken on a supply trip by Hugh T. Lowry.

Loyal Patriot Army (LPA) was a paramilitary unit under BIS operating behind enemy lines. It was formed after the loss of Shanghai and was hated by Japanese authorities. The Japanese called them the "Field Rats of Jiangnan" – they are causing problems everywhere and they breed so fast, it's impossible to eliminate them. LPA was put under SACO as its combat arm. LPA's missions were to protect American operatives and carry out operations against Japanese targets. The SACO Agreement stated that the Americans would supply all necessary equipment; hence the LPA was the first Chinese unit to receive American equipment. The LPA was 100,000 strong at the end of the war.

Most of the American personnel in SACO were Navy personnel. Other than the Yangtze Raider units, most of them were far away from any body of water - some were even stationed in the Gobi desert. Pretty soon they started calling themselves the "Rice Paddy Navy". Due to the nature of their missions, SACO soldiers were lightly armed with submachine guns, carbines and pistols. They were also trained in the use of plastic explosive and TNT for demolition missions.

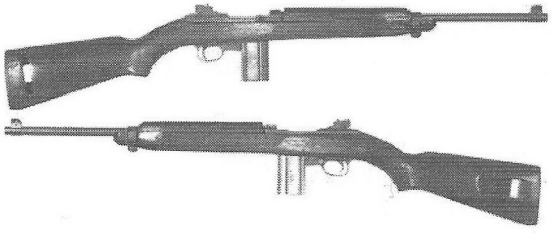
They mainly carried out guerrilla style attacks against rail lines, warehouses, bridges and other valuable targets. They avoided head on battles with Japanese units except at the end of war when they did pursue retreating the Japanese Army in large groups.



Picture 287 A set of commemorative medals for SACO personnel issued by Taiwan's authority in 1974. It stated on the back "To commemorate your contribution in fighting Japanese aggression for freedom between 1942 and 1945, presented by your Chinese comrades."

A. US M1 Carbine

Picture 288 Loyal Patriot Army (LPA) soldier in action. The carbine in his hands was one of the early versions without the bayonet lug. Source Hugh T. Lowry[39]



M1 Carbine Specifications
Operation Method：Short Stroke gas operated
O/A Length：504mm
Barrel Length：458mm
Caliber：7.62x33mm
Weight：2.48kg
Muzzle Velocity：585m/s
Feed：15 or 30 round box magazine

[39] Hugh T. Lowry was a sailor in the US Navy during the war. He arrived in China in 1943. Starting out from Chungking in July, he supervised the delivery of small arms for SACO units throughout southern China. He took 246 pictures recording his trip. His descendents sold the batch of pictures on eBay in 2002. These important SACO artifacts are now in the author's collection.

The Chinese soldiers that Miles encountered were mostly from the south of China with smaller stature and this led to his belief that Mauser rifles were not suitable weapons for them. He considered that the newly available carbines were perfect weapons for Chinese soldiers. Due to this consideration he not only equipped all SACO soldiers with carbines, he also offered the carbines to Chiang's personal guards.[40]

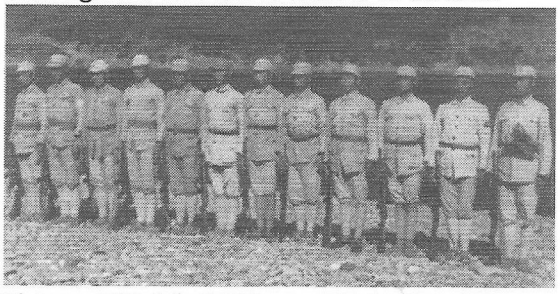
Picture 289 A LPA squad in exercise; note the M1 Carbines and Thompson submachineguns. Source Hugh T. Lowry.

The US Carbine Program started right before the US entered the war. The view was that there were a lot of military personnel that didn't fire a rifle as part of their duty but still need a personal defense weapon. Pistols were considered not powerful enough so another kind of weapon needed to be found. The trial ended with the Winchester carbine design being adopted. Between August, 1941 and August 1945, 6,250,000carbines were produced. This was the largest number of any single weapon that the US produced. Carbines not only armed US soldiers, but they were also widely offered to allies.

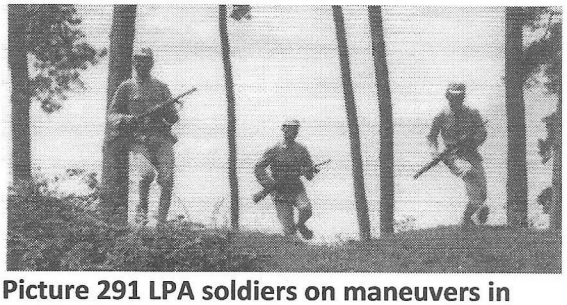
Starting from 1943, SACO brought in M1 Carbines to arm the Chinese soldiers of LPA. With the weapons available to LPA, they had a considerable fire power advantage over the Japanese army and were feared by Japanese troops, who called the LPA the "short rifle soldiers."

The M1 Carbine uses the short stroke operating principal. The gas does not directly impinge on the operating rod but rather impinges on a small cylinder which accelerates and pushes the operating rod to operate the bolt. This was first developed by David Marshall Williams and works particularly well with less powerful cartridges.

M1 Carbines were well liked by the troops. It is light, short and with very insignificant recoil. It was nicknamed "War Baby" by US soldiers. However, in practice, the stopping power of the M1 Carbines left something to be desired. Enemy soldiers usually had to take several hits before they were stopped. It is certainly not in the class of the main battle rifle but then again it was never meant to be one.

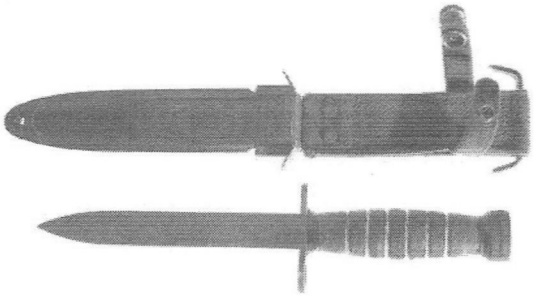


Picture 290 A full LPA squad at attention. Note the four Thompsons on the left. The rest are armed with M1 Carbines.



Picture 291 LPA soldiers on maneuvers in the woods with M1 Carbines.

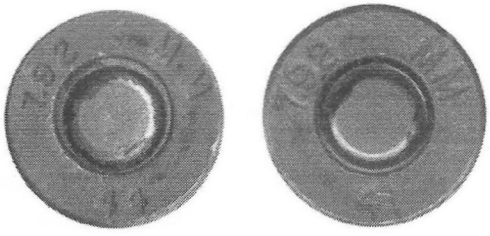
[40] A different kind of War, Milton E. Miles.



Picture 292 The M1 Carbine was modified to accept a bayonet in May, 1944. This is an early M4 leather grip version.

IV. Canadian Mutual Aid Board

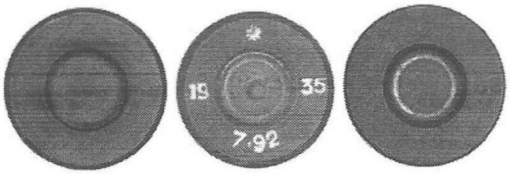
Canada passed its own version of the Lend-Lease Act in 1943, called the "War Appropriation Act." The Mutual Aid Board (MAB) was the administrative organization managing the logistics and coordination with the allies. MAB provided China 7.92 rifle cartridges among other war materials. The head stamps on these rounds are simply 7.92mm and year of production, similar to the 9mm cartridges provided by Canada. More research is needed on this subject.



Picture 293 Canadian produced 7.92 cartridges.

V. Imported 7.92 Ammunition

In addition large quantities of 7.92 ammunition was imported from Germany, Czechoslovakia, Belgium, the United States and Canada. There were also 7.92 cartridges imported from Austria, Norway, Turkey, Britain and France based on post war studies.[41]



Picture 294 Some head stamps of 7.92 cartridges imported from Britain.

Section 5. Captured Enemy Weapons

『Changing gear upon a victorious battle. No more homemade guns but the real deal. The ammo pouches are full and the bayonet shines. Where did the weapons come from? From our arsenals in Japan.』

A folk song from behind enemy lines during the war

There were various units operating behind enemy lines during the war: 1. Nationalist troops purposely left behind. These were still regular army units but just located behind enemy lines. 2. LPA and such paramilitary units. These were not regulars and were often composed of some colorful characters. 3. Communist guerrillas. These were mostly in the north of China and were under the command of the Chinese Communist Central Committee in Yenan (延安).

Due to propaganda, popular literature and stories, the guerrilla activities during the war were greatly exaggerated. They supposedly followed the principles of "run when the enemy approaches, withdraw when the enemy is strong, fight when the enemy is weak, take their weapons when the enemy is eliminated." It certainly happened but it was not the norm. The Japanese troops didn't tolerate any open, active hostility in their

[41] Munitions Identification (彈藥識別), Ordnance Department, Supply Command, Eastern China Military Zone. February 25, 1949

occupation areas. However, due to the immense size of China, the Japanese had to depend a lot on the Puppet Armies to do their bidding. These people also tried to maintain some sort of balance between the various powers. Most of the time, each side would maintain control and try not to provoke each other. When the guerrillas became too active, the Japanese would mount operations to "Broom Clean" (掃蕩) or "Wipe the country side" (清鄉), which would certainly cause severe damage to the operating forces and greatly weaken their power.

Communist propaganda boasted of "Mine Warfare", "Tunnel Warfare" and such. In reality, all the mines and tunnels were useless if the enemy never showed up. These were defensive measures at best and didn't have any real effect on the outcome of the war.

The Communist Central Committee decreed to stop making weapons after 1941 and focused on munitions and explosive production. It was explained that they could take the weapons from the enemy. The reality was that the Communists usually purchased their weapons from Puppet troops, Japanese troops and even Nationalist troops.[42] The rate of Communist expansion during the war simply couldn't be met with the few weapons taken from the enemy.

The Nationalist troops very rarely used captured weapons. The main reason was that the ammunition was not compatible. There were special circumstances such as the Heng Yang (衡陽) Defensive. The munitions supply ran short due to the Japanese encirclement and the Nationalist troops did pick up Type 38s and put them to use. However, the distinct report of a Type 38 from the Nationalist side of the lines still puzzled everyone.

[42] OSS in China : Prelude to Cold War, p. 167-p.168, Maochun Yu, New Haven, CT: Yale University Press, 1996.

Section 6. Other Weapons

『Provide guidance and assistance to all armed civilians, under the Commanders of each War Zones, coordinate the efforts with the regular troops to maximize the fighting strength and achieve the objective of protecting our lands. Engage in wide-spread, general guerrilla warfare behind enemy lines to hurt the enemy and pin down enemy troops.』

Nation Building Effort During the War, Propaganda Guidelines (抗戰建國綱領宣傳指導大綱), June 1938

During the war, the Chinese Communists established many "Operational Bases" (根據地) behind enemy lines. Shortly after the war broke out, Communist troops stopped taking orders from the Central Government. In response, the Central Government no longer supplied any funds, equipment or munitions to the Communist troops. The Communist Central Committee directed their units to find their own ways to re-supply themselves. Many of these bases set up arsenals to produce weapons, munitions and other necessities such as candles, soap, etc. Some were larger than others but they all had the same problems in finding supplies of raw materials.

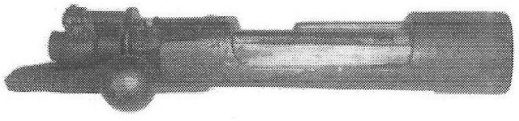
Most of the weapons were made by casting, or hand forging, assisted by some small hand operated machines. A lot of the steel stock came from railroad track taken out by the guerrillas. The quality of the weapons varies wildly and the quantity was generally quite limited.

There were a lot of gun-making squads that traveled around the countryside before the

war. They went around and made guns to order for the rich and powerful. There were also local authorities that set up gun-making facilities in their territories. These weapons were usually copies of famous weapons such as Vz, FN, Hanyang and such. They were certainly serviceable, to a degree - the customers would demand demonstration before taking delivery. However, prolonged use could result in as much harm to the user as the intended target. A lot of these gun-making individuals were absorbed into the Communist arsenals during the War.

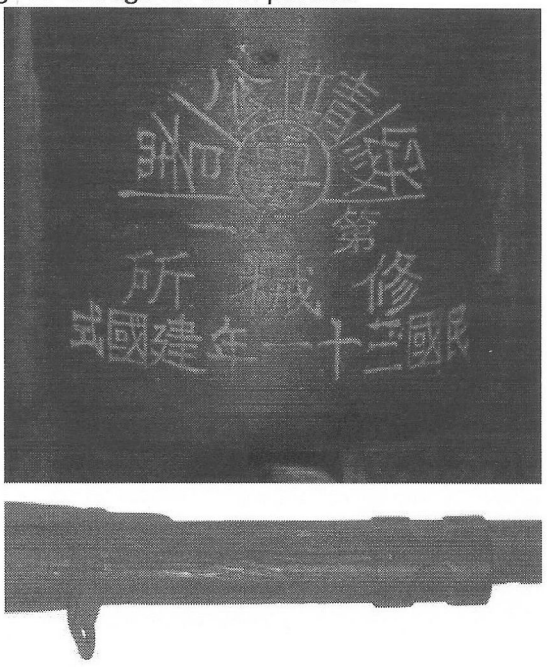
Picture 295 A guerrilla soldier from Hainan (海南) Island. The rifle is clearly a muzzle loader from the 19th century. Judging by the sling swivel in front of the trigger guard, it was originally military issue. From Da Lu Monthly (大路月刊), #3

The homemade weapons clearly would not have the same kind of finish as the ones from a formal arsenal. Some of the homemade weapons would show a lot of tool marks. The internal parts may be of inferior quality or have inadequate heat treatment. All in all, they might only fire a few rounds, but a lot of time that might be all that was needed.

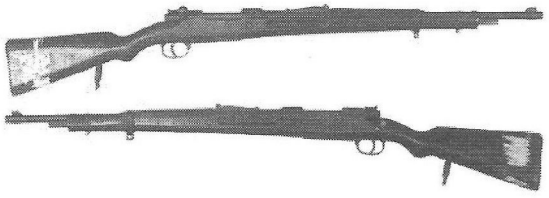


Picture 296 A Mauser receiver made by some unknown source. There is no recoil lug and the front receiver ring is round in shape. It does have a Mauser banner on the top of the receiver ring.

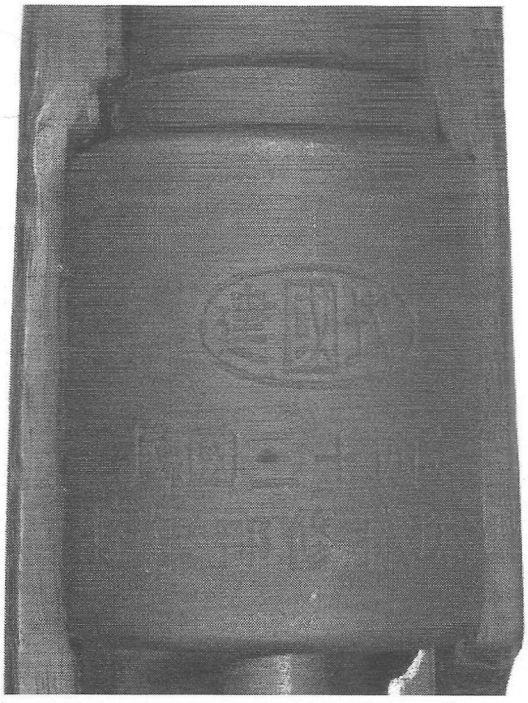
Some of these weapons also tried to duplicate the markings on real weapons. Often words were misspelled or just a random collection of letters. Probably because neither the seller nor the buyer could really read, as long as there was something foreign stamped on it, it would be good enough for both parties.



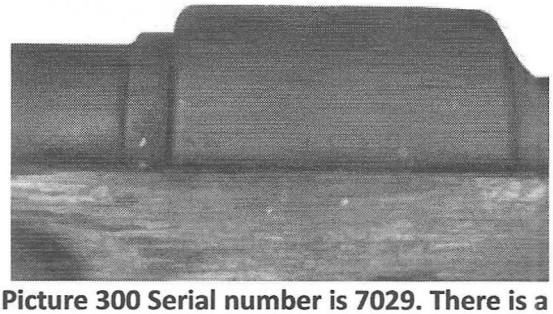
Picture 297 "Type Nation Building" made in the First Repair Depot of the Guangdong Pacification Office, 1942. This is a copy of FN 1930. Paul Milbury collection.



Picture 298 A Zhong Zheng Shi copy by Wan's puppet regime repair deport (same location as above). Source G.



Picture 299 Receiver marking stating from top: "Type Nation Building", "Produced in 1945" and "By the Army Ministry Repair Deport". Source G.



Picture 300 Serial number is 7029. There is a swastika mark in front of the receiver for some reason. Source G.

A. Type Xiang Yin (向應式) Rifle

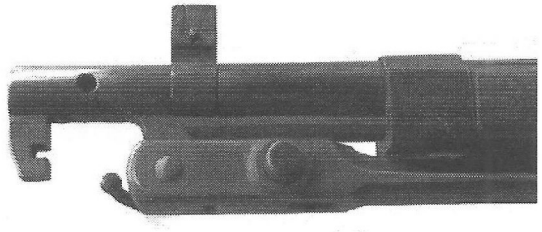
Picture 301 Type Xiang Yin semi-automatic rifle. Beijing Military Museum.

During the War, the 120th Division of the Chinese Communist had a repair depot set up at Zi Niu Gou (牸牛溝), Jia county (佳縣), Shenxi (山西). In 1944, Wen Chengding (溫承鼎) utilized scrapped gun parts to assemble a gas operated semi-automatic rifle. The rifle was named after the political director of the 120th Division, Guan Xiangyin (關向應). Only four were produced.

B. Type 81 Short Rifle

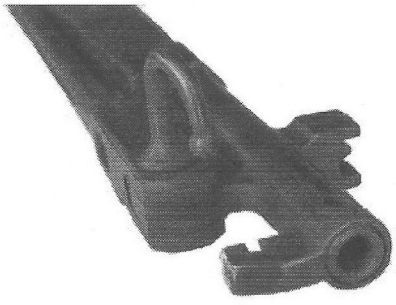
In September, 1940, the Jin Ji Yu (晉冀豫根據地) Operating Base Arsenal of the Chinese Communists started the production of the Type 81 Short Rifle. The rifle was designed by Liu Guifu (劉貴福). It was based on the rifle he had made when he was in Yang An, taking features from the Hanyang, Vz-24 and Type 38 rifles. It was shorter than a rifle but longer than a carbine. The caliber was 7.92 and weighed 3.36 kg. It also had an integral folding spike bayonet.

Picture 302 Partial receiver view of a Type 81 short rifle. Note the 2 venting holes on the top of the receiver ring, the olive shaped cocking handle and the T88 style bolt release. The clip charger relief cut seems to be a bit shallow. Courtesy of Mike Wee.



Picture 303 The side view of the folding spike bayonet base.

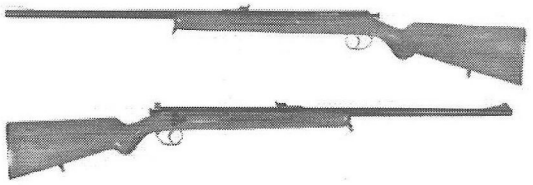
Picture 304 The view with the spike bayonet extended.



Picture 305 The other side of the spike bayonet base.

Liu also produced prints and templates and issued them to other Communist arsenals. The total production figure was reported as 8,700 guns. This model was the largest number produced by the Communist arsenals during the war. The parts were supposedly interchangeable. However, the quality was still affected by the limited material supply. Some reported that the gun would seize up after only a dozen shots were fired.

C. Small Bore Training Rifles



GECO Model 28 Small Bore Rifle Specifications

Operation Method: Manual Turn Bolt
O/A Length：1150mm
Barrel Length：680mm
Caliber：5.4mm(.22 LR)
Weight：3kg
Muzzle Velocity：~380m/s
Feed：Single shot

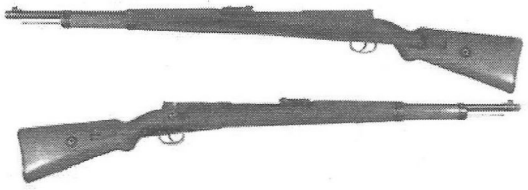
After WWI, although under the strict limitations of the Versailles Treaty, various paramilitary units were formed and engaged in military style training.

Picture 306 Side wall marking of GECO small bore rifle.

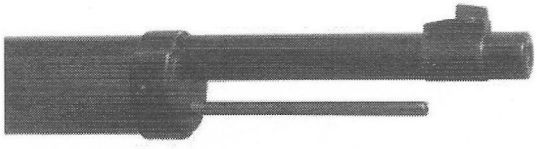
Due to the scarcity of military rifles, many German companies started manufacturing unrestricted small bore hunting rifles. These rifles were used for training the members of those paramilitary units. There was a long tradition of using small bore rifles to train new re. It was used for the recruit to get familiarity of firearms handling, aiming and firing. The low re and shot report reduces the fear factors and allow trainee to focus on the subject at hand. It also cost far less to practice than the regular military rifles.

GECO(Gustav Genschow & Co. - GECO) was one of the manufacturers. Based on the Japanese data (see Appendix 5), it listed two

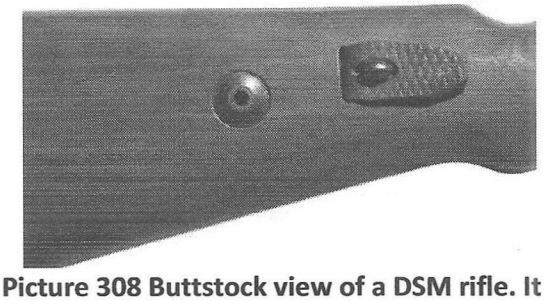
captured small bore rifles – GECO Model 28 and DSM(Deutsches Sportmodell). The Model 28 looks like a sporting rifle but the DSM actually resembles a Mauser 98a series rifle. There were several producers of DSM during that period, including Mauser, Walther, etc.



DSM 34 Rifle Specifications
Operation Method: Manual Turn Bolt
O/A Length：1150mm
Barrel Length：660mm
Caliber：5.4mm(.22 LR)
Weight：3.5kg
Muzzle Velocity：~380m/s
Feed：Single shot



Picture 307 The muzzle view of a DSM rifle. The cleaning rod is fixed and cannot be removed.



Picture 308 Buttstock view of a DSM rifle. It has the side mount sling and firing pin take-down disc.

There is no record of China importing small bore rifles for training. One possibility was that the 29th Route Army had a basic training camp set up at Nan Yuan (南苑) for college students from Beijing. These might have been used for those students.

Section 7. Combat Experiences and Comments

『This is what Dr. Sun Yet-Sen taught us. The revolution army must have expert skills. We should use 60 rounds for practice if we only have 100 rounds of cartridges. The 40 left would be used in combat, and we do expect to hit with all 40 shots.』

Chiang Kai-Shek, the 3rd Nan Yue (南嶽) Military Conference Speech, Postmortem Meeting of the Zhang Sha Campaign (長沙會戰) October 16, 1941

From all the above mentioned various rifles used in China during the war, one can clearly see the chaos that existed at the time. It was a supply nightmare to have different weapons, different parts and sometimes different calibers.

A 17th Army TO&E report dated Feb. 1945 stated:
Total strength: 18,103 men with 5,337 rifles, among them:
98 Russian 7.62mm
1,282 Vz-24 7.9mm
2,423 Hanyang 7.9mm
132 Zhong Zheng Shi 7.9mm
253 Japanese Type 38 6.5mm
192 various 7.9mm type
84 1888 7.9mm
60 Hanyang Carbines

The mix and match certainly affected the overall strength of any fighting force. The primary cartridges supplied by the Ordnance Office arsenals during the war were 7.92 cartridges for rifles, LMGs and HMGs. The rifle cartridges also were divided into spitzer and round nose rounds. All the other calibers had to be either taken from inventory or

reloaded in some fashion. The supply channel didn't have them on hand. The first line troops would probably consume the older weapons in a few large-scale battles. The 2nd echelon, reserve troops and the local militia would hold on to those older weapons to the end of the war if they didn't engage in any major battle.

Picture 309 Steyr 1888 straight pull rifles and the Jiangnan Arsenal produced Kuaili (快利) rifles were still in use when the war broke out.

On the human factor side, the Chinese soldiers also were less educated and lacked modern skills. As mentioned above, it would take two to three months just to teach someone to shoot with some accuracy. During the wartime, it is doubtful that there was two to three months time available before soldiers were thrown into a firefight. The effectiveness of an infantryman with a rifle was a real question. In the third Nan Yue Military Conference, it was reported by General Wang Yaowu (王耀武) that soldiers would fire a few shots at night just to embolden themselves but the action would reveal their positions to the enemy. This clearly reflected that there was also a shooting discipline issue.

The primary rifles deployed during the war were Mauser series rifles and Hanyang rifles. Other than the Hanyang rifles they used the 7.92x57mm spitzer cartridge, which was the same cartridge used in the light machine guns and heavy machine guns. The 7.92m round is more powerful than the Japanese 6.5mm round. There was a report dated 1916 from the Army Department: "(7.92mm round), once people & horses were hit, immediately immobilized" and "(6.5mm), without hitting the vital organ, people & horses could still function after being hit". Based on this, the differences were clearly understood. However, the Japanese soldiers did have much better education and trainings, which compensated the weakness of their weapons.

The 7.92 cartridge is a very powerful round and had a very long effective range. It is considered a full charge round by today's standard. However, it does produce significant recoil as well. This must have been a problem for the soldiers from the south of China with smaller stature, let alone the "kid soldiers" often seen towards the end of the war. There was a good reason that the Qing military actually adopted the 6.8x57mm cartridge.

The Zhong Zheng Shi was one of the last Mauser rifles deployed and it is close to as good a bolt-action rifle as can be. The last imported batch of 98k all had bent bolt handles but the Zhong Zheng Shi remained with a straight handle throughout its life. This is due to the way a Mauser cocks its firing pin on opening. While opening the bolt, one needs to overcome not only the main spring but also any friction caused by the cartridge - contamination, head space issue, etc. A straight bolt handle provided an easy way to hit it open, or sometimes kick it open. It was probably a better decision go with a straight bolt handle at that time with the inferior quality of cartridges available.

The steel used in Chinese arms was all imported from Europe prior to the war and was of very good quality. When the Burma Road was cut , the ordnance industry was forced to produce the steel and other alloys domestically. However, the weapons all still had to pass a high pressure round test before they could be accepted. The rifles produced during the war were still very serviceable other than the obvious tool marks left on the weapons. The rifles produced prior to the war such as the ones from Gongxian Arsenal were well polished, blued and marked with serial numbers everywhere. They were very close

to German standards if not on a par with them.

The other issue with Chinese firearms is: Were they bootleg copies or licensed production? The Hanyang rifles were clearly licensed copies for the machinery and prints were purchased from Ludwig Lowe. The Type 1st Year was in the same situation with Guangdong Arsenal. The Zong Zheng Shi prints were obtained from Germany with the intent to enter production so it couldn't be a bootleg copy. In general, licensed production would limit the arsenal of production and number of pieces produced. In China's case, the weak industrial strength might lead people who granted licenses to believe that it wouldn't be a problem. But when other arsenals started production and continued to produce them years on end, it became a gray area.

In October 1943, Capt. Wm. W. Richardson, Jr. of the Infantry Training Center submitted a memo titled: "Deficiencies of Chinese Weapons used at ITC", in the rifle section he reported:
"3. Approximately 250 Generalissimo Rifles have been used for instructional purposes... these rifles have fired a total of 209,410 rounds since issue...
When received, practically all rifles had bores finely pitted indicating improper cleaning after proof firing. This has resulted in "key holing" in some cases after as few as 300 rounds have been fired...
The front sights were loosely fitted and after firing they occasionally drop out...
The bolt was loosely fitted but no unusual troubles have resulted...
The firing pins in some cases broke easily or became shortened...
Follower springs became broken rather easily..
Upper band and bayonet catch became loose very easily..."

These rifles could have come from any one of the Zhong Zheng Shi production Arsenals. Upon close examination, none of these were major technical issues but quality control issues. The management and operating procedures were in question here. Any factory would have rejects and defects, it is only a problem when the ratio became too great and even more so when the defects were mixed in with the final accepted products. The problem resides squarely on the management.

Generally speaking, even under tremendous stress, the rifle and cartridge supply were not greatly lacking during the war. There were only very rare situations where the troops literally ran out of ammunition and these situations were mostly when troops were surrounded by the Japanese and supply lines cut off. This had to be attributed to the hard working of all the workers in various arsenals and China's ordnance industry as a whole.

Picture 310 Wartime government posters, from left: "We won't stop our resistance until the enemy stops his aggression," "The closer to victory, the harder we need to struggle," "Long live the Republic of China," "We're determined to fight without stopping to stop the enemy's violence." All were issued by the Political Department of the Military Committee.

Chapter 5. Light Machine Guns & Automatic Rifles

『Every infantry soldier must practice the use of the light machine gun, heavy machine gun and mortar. We need to train them to have this knowledge as part of their general skills.』

Chiang Kai-Shek：The Fourth Nan Yue Military Conference Speech (2) Postmortem Meeting Chang De Campaign (常德會戰) and training essentials for counter-attacks going forward, February 14, 1944

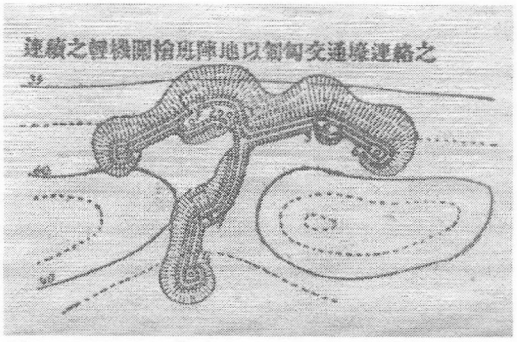
Section 1. Light Machine Guns in the Chinese Army

Light machine guns were mainly issued to the infantry platoon. The "Type 21st Year Division" separated the rifles and light machine guns into separate squads. There were five squads in a platoon, three were infantry squads with rifles and two were light machine gun squads. The squad consisted of one squad leader and nine enlisted men. The light machine gun squad was equipped with one light machine gun and 6 rifles.

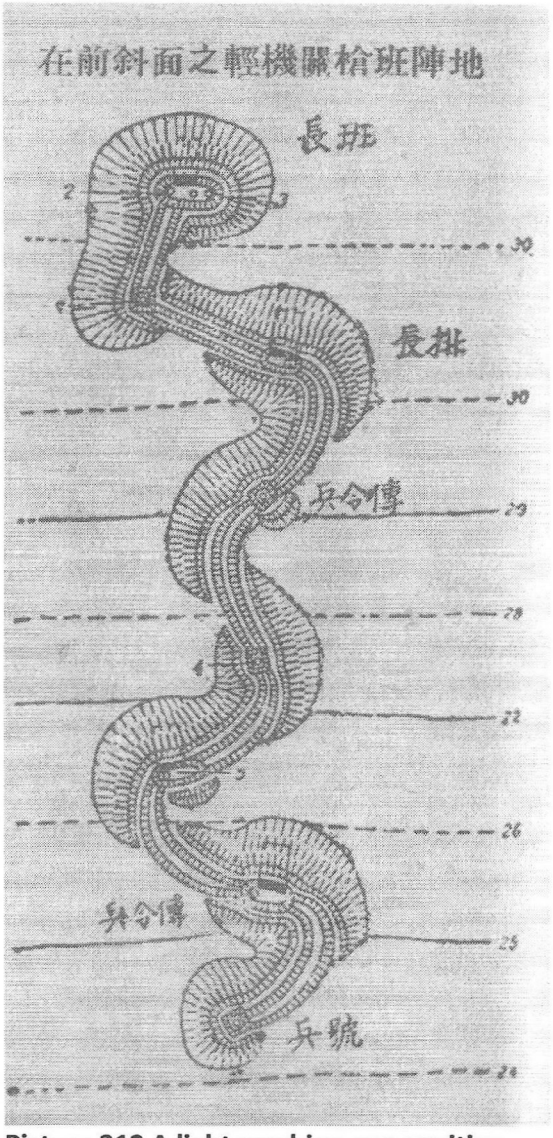
The "Type 25th Year Consolidation Division" merged the light machine gun into the infantry squad but the squad was divided into a "Rifle Team" and a "Light Machine Gun Team." There were three squads in a platoon and fourteen people in a squad including the squad leader.

In general, there were six to nine light machine guns in an infantry company.

The basic daily ammunition supply unit (補充基數) was 1,000 rounds and the monthly supply unit (based on five day's consumption) was 5,000 rounds.



Picture 311 A light machine gun position layout. "Battle Field Construction", June, 1935.



Picture 312 A light machine gun position layout if located on a front slope. "Battle Field Construction", June, 1935.

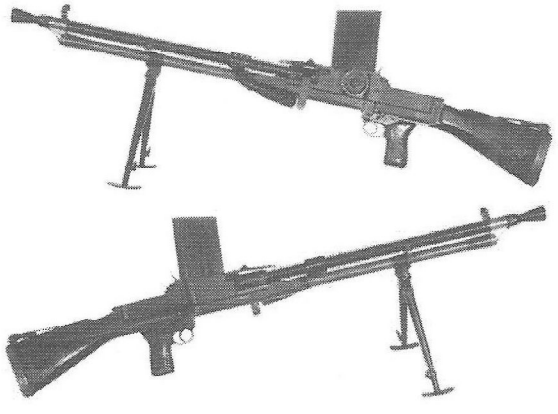
Barrel Length：602mm

The Ordnance Office Arsenal Production Report for the last 4 years The Wartime Production Bureau						
Year	1940	1941	1942	1943	1944	1945
ZB-26	1,324	2,440	6,000	9,391	13,574	13,863

Picture 313 Light machine gun training at the Kunming Infantry Training Center in 1944. Note the four Browning Automatic Rifles and three ZB-26s. Source D.

Section 2. The Domestically Produced Light Machine Gun

I. The Sichuan, Guangdong, Shenxi, Taku and Other Produced ZB-26s



ZB-26 Light Machine Gun Specifications
Operation Method：Gas operated
O/A Length：1,165mm
Caliber：7.92x57mm
Weight：9kg
Muzzle Velocity：830m/s
Feed：20-round box magazine
Rate of Fire: 550 r/m

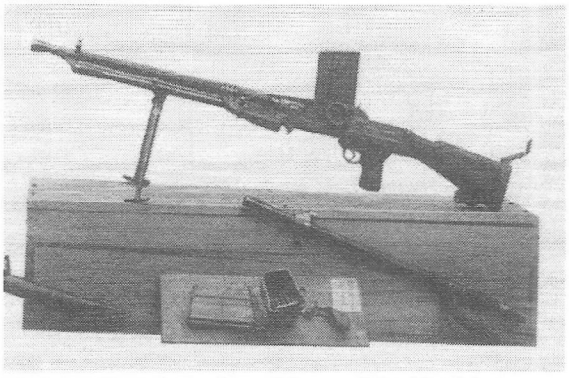
In 1920, the Czechoslovak gun designer Vaclav Holek of the Parga Zbrojovka (Prague Armory) started working on a new light machine gun design. He later joined the Brno Factory to complete his design. The experimental version was called Lehky kulomet Praga vzor 26 and was successfully tested by the Czechoslovakian Defense Ministry. The Czechoslovakian Army adopted it as the Zbrojovka Brno Vzor 26 (ZB-26 or Vz 26). China purchased large quantities of this model from Brno and this was also the light machine gun widely produced during the war.

Between 1927 and 1939, Brno records show that there were 32,272 ZB-26s shipped to China.[43] Among these, 17,163 were procured between 1937 and 1939. The last batch of 100 guns was shipped out in April, 1939. Guangdong Province purchased 1,000 and the Northwestern Army purchased 1,332 between 1930 and 1932.

The first successful copy in China was accomplished by the Taku Naval Dockyard in 1927. After Taku, many arsenals in China started producing the ZB-26. It remained the primary light machine gun after the war, into China's civil war and beyond. In 1934, the Ordnance Office decided to adopt the ZB-26 as the standard light machine gun: "There were many copies produced in China, the

[43] The history of the Brno factory "Zbrane Pro Cely Svet", Appendix.

Taku ones were the best. However, due to the lack of templates and standard drawings, parts were not standardized and interchangeable. The steel used was also below standard."[44]



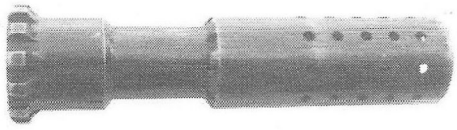
Picture 314 A postcard issued by Yushkan, Tokyo, Japan, displaying a captured ZB-26 light machine gun during the "918 Incident."

In 1934, the Ministry of Finance ordered 5,000 ZB-26s from Brno. The Ordnance Office had asked Minister Kong to obtain the drawings and gauges. However, since the order was only for 5,000, the manufacturer was not willing to comply. The only thing received was a set of the acceptance gauges and even that took a lot of negotiation.

Subsequently, the Ordnance Office sent two engineers and one technician to Brno to "supervise" the contract production. They were secretly ordered to carefully observe the production processes and procedures. These people returned and started the design drawings. Some of the drawings were based on the gauges on hand and others had to be recreated. When they were completed, the drawings were forwarded to the Gongxian Arsenal. It was estimated that the production could start in a year's time.

[44] Yu Dawei, 1934Annual Report, Technical Branch, The Ordnance Office.

Picture 315 Nationalist soldiers in exercises. Note the blank adapter in place of a flash hider. War Periodical, No. 9



Picture 316 A ZB-26 blank adapter. It is used in place of the normal cone shape flash hider for firing wood-tip blank cartridges.

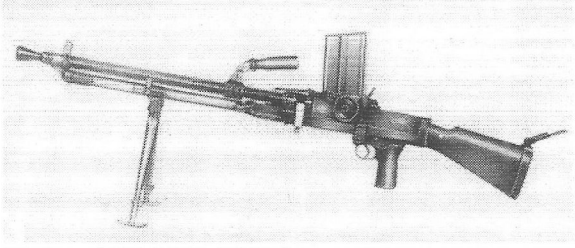
Production began in the Gongxian Arsenal but output was fairly limited – the record shows that they could only produce a few hundred guns a year. Somehow the plan didn't work out as everyone had hoped.

"..After the January 28, 1932 Shanghai conflict, the central government began a serious effort to prepare for an inevitable total war against Japan. The light machine gun, being one of the most important infantry small arms, received a lot of attention. In the summer of 1936, the Ordnance authority contacted Brno for a formal license production agreement. Brno sent representatives to China to work out the details and an agreement. The July 7, 1937 Marco Polo Bridge Incident resulted in a change of minds on Brno's part.... "

After Brno's rejection, the Ordnance Office tried to switch to the Danish Madsen light machine gun with a flexible mount, to be used as both a light machine gun and heavy machine gun. The 51st Arsenal was created for this purpose but the drawings, tools and

jigs were destroyed on the Burma Road in an air raid. The plan had to be changed again, back to the ZB-26.

The 21st and 51st Arsenals were the two most important ZB-26 producers during the war. The 51st Arsenal, located in Yunnan, started production in June, 1941. Total production for the year was 450 guns. The 51st Arsenal merged with the 22nd Arsenal in 1942 and formed the 53rd Arsenal, which became the largest producer during the war. The average output was 300 guns per month, with the total production during the war 14,920 guns. It averaged about 430 per month at the end of the war but this was still short of the original 500 guns per month target. However, due to its remote location and lack of skilled workers, the qualities of its guns were the worst among all arsenals. Their guns often couldn't fire in full automatic.



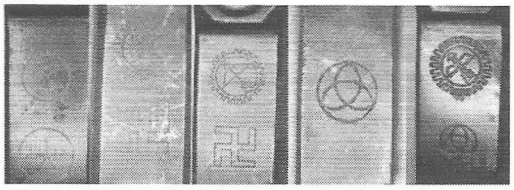
Picture 317 A ZB-26 light machine gun produced by the 21st Arsenal. Source B.

Picture 318 The 21st Army Repair Depot produced ZB-26. It was under the warlord Liu Xian. Source B.

Picture 319 March 1942, soldiers from the 185th Division are demonstrating the usage of the ZB-26. Note the Nationalist Star insignia on the front of their helmets. The 185th Division was part of the Yangtze Defense Forces. This Division was expanded from the Wuhan garrison troops and it was Chiang Kai-Shek's personal guard troops. They often did demonstrations for the Luo Jia Shan (珞珈山), Officer Training Corp., in Chungking. Photo by Black Star Photographs. Source A.

The 21st Arsenal took over the 20th Arsenal's light machine gun manufacturing branch in 1939 which was the combination of the Huaxing Machinery Shop and the Chungking Repair Depot. The 21st Arsenal expanded the production facility and started manufacturing the ZB-26. In 1942, the guns made in the 21st Arsenal all had interchangeable parts. Also, they changed the manufacturing processes. They didn't mill the receiver out of a block of steel but used forging instead. The raw steel was forged into shape and then milled. It was claimed that this approach could save about a third of the material.

Yan Xishan's Northwestern Enterprise (西北實業公司) had a branch called the Northwestern Forging Factory (西北鑄造廠), which started ZB-26 production in 1935. After the fall of Taiyuan, part of the factory was relocated to Guang Yuan (廣元) Schichuan. It primarily produced the ZB-26 during the war, and its production rate reached 150 to 200 guns per month.



Picture 320 The Chinese produced ZB-26 receiver markings. From left: 5[3rd] Arsenal, 21st Arsenal early, 21st Arsenal late, 41st Arsenal early, 41st Arsenal late.

In 1935, the 1st Arsenal of Guangdong started ZB-26 production. It was renamed the 41st Arsenal during the war and its production rate was about 260 to 300 guns per month.

The Zhejiang Iron Works started ZB-26 production in 1938. Its version was called the "Type 77 Light Machine Gun"; monthly production output was 60.

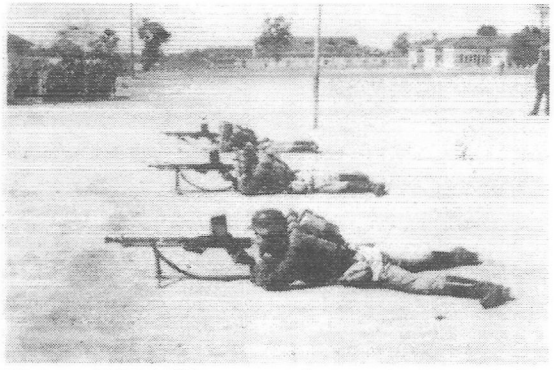
Picture 321 The Type 77 light machine gun manufactured by Zhejiang Iron Works. Note the regular rifle rear sight for the magazine well was relocated to the right side of the gun. It reportedly had gas adjustment feature.

An interesting note is that the ZB-26 didn't have a Chinese name. It was simply referred to as the Czech light machine gun.

The ZB-26 is a gas operated gun. The locking lug is at the top-rear of the bolt. For this reason, it has more stringent requirements for cartridge case strength. In 1943, a 25th Arsenal document indicated "To prevent the expended shell from sticking in the ZB-26 and resulted in a malfunction, we increased the wall thickness of the case but not to affect the external dimensions". This change "relatively" addressed the problem. The ZB-26 was designed to use lighter spitzer cartridges only; the receiver wasn't strong enough to handle the heavy spitzer cartridges. This was because of the way gas was collected near the muzzle. It resulted in high sensitivity to the ammunition employed. On the ZB-30, a gas adjustment ring was added. On the ZB-33 and Bren, the gas collection point was moved rearwards to address this issue.

In zeroing the gun, each barrel had to be zeroed individually. The rear sight was to be set at 200 meters so that the bullet hit on the line of sight at 25 and 100 meters. If windage adjustment was required, it had to be done by moving the front sight. If the point of impact was too high or too low, a different front sight blade could be used. There were front sight blades in different heights issued with each gun. Before the gun could go on a combat mission, each spare barrel had to be zeroed. According to Reference 30, the empty magazine was removed by the gunner and the assistant gunner put in the new magazine. The assistant gunner was to keep track of how many magazines had been used and change the barrel on the 10th magazine. For the Bren it was 270 rounds before changing the barrel.. This equated to 13 magazines On the ZB-26. The Brno ZB-26s were made with the best steel from Skoda. According to "The Machine Gun" [45], even if the barrel turns red hot due to rapid firing, one can simply dump some cold water on the barrel to cool it down without causing any damage to the barrel.

[45] George Chinn. 1950.



Picture 322 Military academy students doing light machine gun drill. Courtesy of Yang Ye (楊燁).

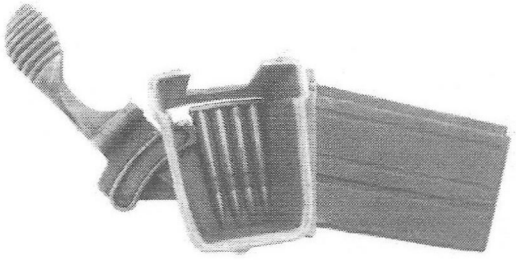
Picture 323 Military academy students doing text book light machine gun deployment. Note the spare barrel on the back of the gunner. Courtesy of Yang Ye (楊燁).

The ZB-26's magazine is inserted from the top. The expended cartridges fall out of the gun under the receiver. There is a dust cover on the ejection port and it automatically opens on charging the bolt. The benefit to having the empty cartridges fall under the gun is to prevent reflections off the cartridges revealing the gunner's position.

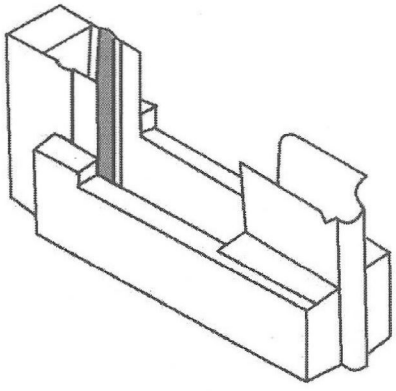
Because of the top inserted magazine, the line of sight over the barrel is blocked. The rear and front sights are offset to the left. The line of sight and bullet trajectory differs by about 1 inch. If the shooter puts his cheek directly on the stock, the line of sight will be blocked so it is necessary for the shooter to put his left hand on the stock and rest his cheek on the back of his left hand to create an appropriate offset from the stock. The line of sight would then line up perfectly with the shooter's right eye.

Another benefit of the top inserted magazine is that the ZB-26 can be fired very close to the ground. This greatly reduced the exposed profile to enemy fire.

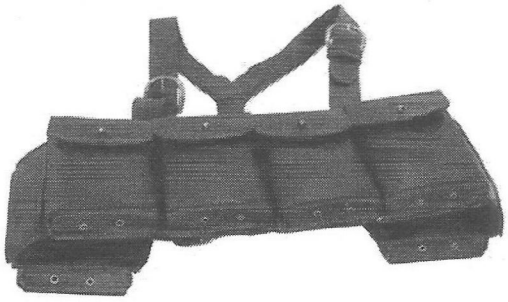
The ZB-26 showed up at the right time and became the most widely deployed light machine gun during the war. It went through many campaigns and provided badly needed firing power for the Chinese army.



Picture 324 The ZB-26 magazine loader. It can strip the cartridges from the stripper clip and load 5 rounds in one push.

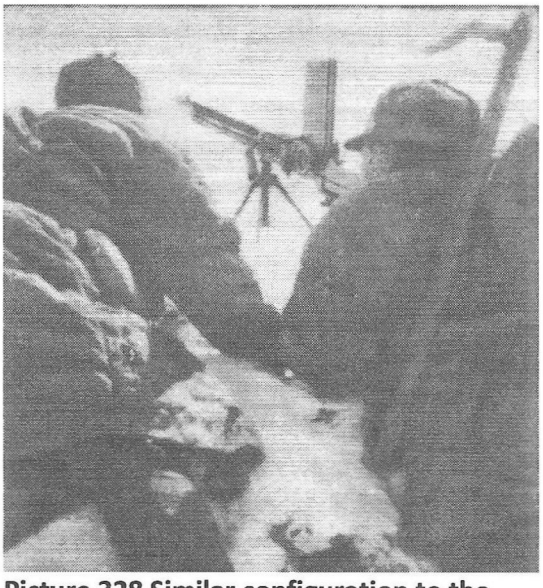


Picture 325 The magazine loader for the Type 41 light machine gun. There is no record of production of the Czech pattern magazine loader but there are reports of using the magazine loader in the field. This may also be the type in use during the war.

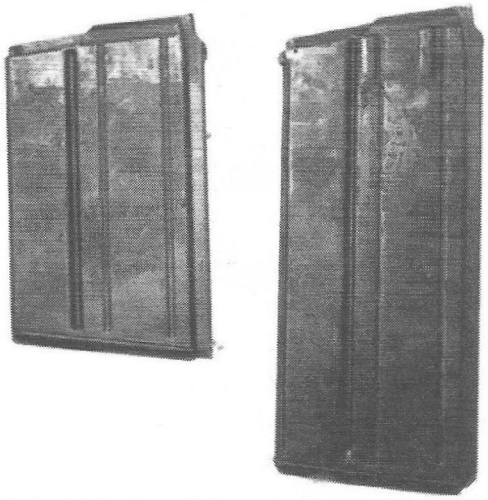


Picture 326 Leather magazine pouch for ZB type machineguns. Hand craft replica by the author.

Picture 327 Soldiers fighting along the Jinpu rail line (津浦線). Note the long (30 round) magazine and tripod for the ZB-26. Lian You #134.



Picture 328 Similar configuration to the above in Shenxi. Lian You #135.



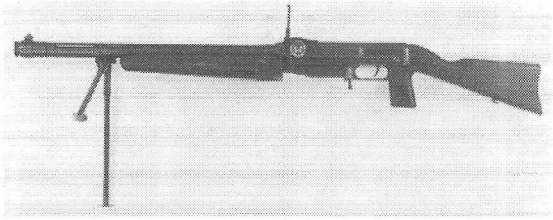
Picture 329 20 and 30 round magazine made by Brno, DOD Pattern Room. Courtesy of Chuck Karmer.

Picture 330 Workers in the 21st Arsenal assembling ZB-26s. Lian You #157.

Picture 331 There is a small rubber buffer in front of the trigger on the ZB-26. It deflects the ejected cartridge cases to the front. Without this buffer, the cartridge cases would hit the trigger guard and/or trigger finger. Sometimes the cartridge cases could

even bounce back into the action resulting in a jam.

II. Sichuan produced KE-7 (Neuhausen KE7) Light Machine Gun



Picture 332 A KE-7 made in Switzerland. Captured in Korea by the US Army. Source B.

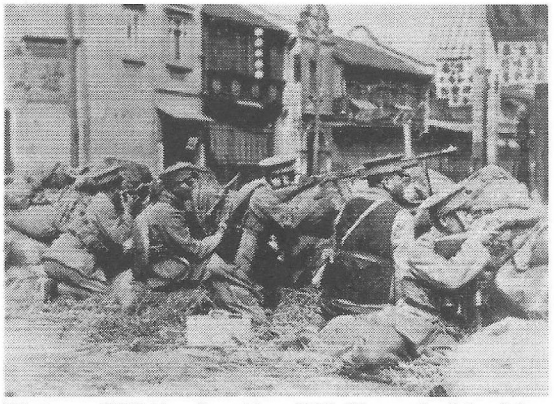
KE-7 Light Machine Gun Specifications
Operation Method：Short Recoil
O/A Length：1,190mm
Barrel Length：601mm
Caliber：7.92x57mm
Weight：7.7kg
Muzzle Velocity：700m/s
Feed：25-round box magazine
Rate of Fire: 550 r/m

Pic 5 Battle of Ping Jiang (平江), Hunan in 1939. Note the KE-7 has a perforated heat shield which differs from the Swiss model. It may be a Sichuan produced gun. Taiwan National Achieve.

The KE-7 was designed by Kiraly and Ende of Schweizerische Industrie-Gesellschaft, Neuhausen (SIG). It was not a well known weapon and was only produced in limited numbers China was one of the few large buyers of this model.

Between 1928 and 1939, China purchased a total of 3,025 KE-7s from Switzerland. These were purchased with spare barrels and 44,550 magazines. Guangdong Province purchased 200 guns and 4,000 magazines in December, 1928.[46]

The Huaxing Machine Works of Huaxi Xingye Enterprise (華西興業公司) in Sichuan was a civilian owned company. The owners were two brothers named Hu Zhongshi (胡仲實) and Hu Shuqian (胡叔潛). In 1933, with the backing of Liu Xiang, they acquired the machinery of the China Iron Works in Shanghai and set up their owns shop in Da Xi Gou (大溪溝) in Chunking, the Production of the KE-7 started in 1934. When production halted in 1936, a total of 6,000 guns had been manufactured.



Picture 333 During the 128 Shanghai Incident, these Chinese troops in North Station (北站) are manning a KE-7. Source A.

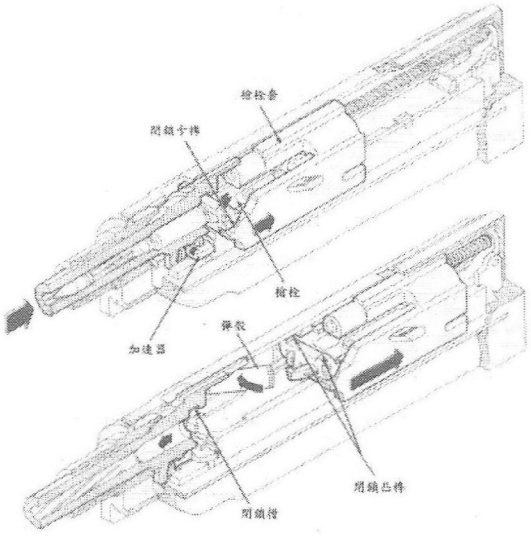
The factory was acquired by the Nationalist government in October, 1937 and renamed the 1st Sichuan Arsenal. It was soon merged

[46] Rüstungsindustrie und Kriegsmaterialhandel zur Zeit des Nationalsozialismus

into the Machine Gun Factory of the 20th Arsenal. Later it was merged into the 21st Arsenal and switched to ZB-26 production after 1939. [47]

Picture 334 Another picture from the 128 Shanghai Incident. This KE-7 is being used as an anti-aircraft gun. Courtesy of Leeland Ness.

The 746th Regiment of the 125th Division received "three light machine guns per company, they were 'floral pattern barrel' pattern guns made in Chungking"[48] before they were sent to the Tai Er Zhuang Campaign (台兒莊戰役) in Xu Zhou. This clearly identifies the features of the gun and its origin.



Picture 335 KE7 operation drawing.[49]

III. Jinglin Produced 8mm Automatic Rifle

Picture 336 A Jinglin Arsenal produced Chauchat automatic rifle, from a Japanese captured Chinese weapons manual. Courtesy of Leeland Ness.

Chauchat Automatic Rifle Specifications
Operation Method：Long Recoil
O/A Length：1,140mm
Barrel Length：470mm
Caliber：7.92x57mm
Weight：9.2kg
Muzzle Velocity：845m/s
Feed：20-round box magazine
Rate of Fire: 250 r/m

Jinglin Arsenal produced a copy of the French Chauchat Automatic Rifle (CSRG M1915). The total produced was around 100 guns. Due to

[47] The Ordnance Industries in Chungking during the War, Lu Dayue (陸大鉞), Tang Runming (唐潤明), Chungking War of Resistance Book Series, 1st Edition, 1995.

[48] Battles Surrounding Tang County, Yao Chaolun (姚超倫), Battle of Xu Zhou, p. 90

[49] Reference 13, Vol VI, p. 408.

the less than ideal performance, production was halted.

The Chauchat was an automatic rifle designed and produced by the French during WWI. It was the first mass issued military automatic rifle. The original caliber was 8mm Lebel. After the US entered the war, the French supplied a batch of Chauchat in 30-06 caliber to the US troops. Some said it was due to the re-chambering that the gun malfunctioned a lot. The US soldiers often threw them away. The magazine had a window cut to show how many rounds were left but it became a window gathering dust and debris which subsequently followed the cartridges into the chamber. That was one of the reasons attributed to its troublesome service record.

From that point on, it earned the reputation of one of the worst designed and performing guns in history.

Picture 337 Section view of French Chauchat.[50]

IV. Liao Produced Type 17 Light Machine Gun

Picture 338 Liao Type 17 Light Machine Gun. Beijing Military Museum.

Type 17 Light Machine Gun Specifications

Operation Method：Gas operated
O/A Length：1,110mm
Barrel Length：485mm
Caliber：6,5x50mSR
Weight：10.75kg
Muzzle Velocity：778m/s
Feed：30-round hopper
Rate of Fire: 600 r/m

The Type 17 was a copy of the Japanese Taisho 11 light machine gun. Due to the strange shape of the butt stock, it was nick named "Slanted Handle" by the Chinese. The most notable feature of the gun was the feeding mechanism. On the left side of the gun there is a hopper in which 5-round clips could be dropped The feeding mechanism would strip the cartridges from the stripper clip and feed them into the gun. It's a very convenient design since the infantry men can share their stripper loaded cartridges with the machine gunner without all the hassle of stripping the rounds and loading them into a magazine.

The Japanese military doctrine required lubricated cartridges for the T11 to prevent cartridge cases cracking and head separations. There was an oil brush attached to the hopper. Without the lubricant, functioning couldn't be guaranteed. However the opening also gathered debris and dust so it was not a good mixture in combat situations. The hopper was also quite complicated in design and prone to malfunction. The whole idea was dropped in the later Japanese machine gun series. Modern collectors find that as long as the head space is correct and the gun is clean, the gun functions perfectly well even without oiled cartridges.

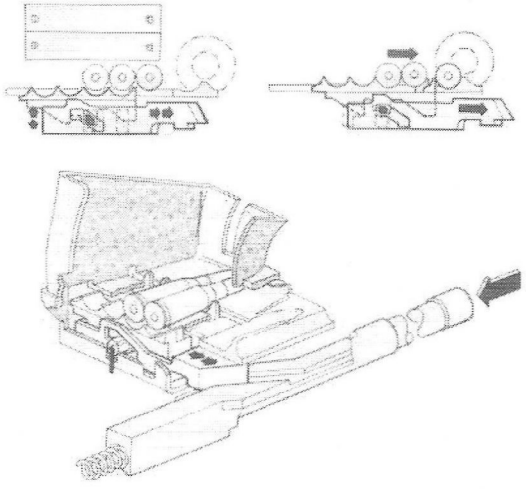
The Type 11 was standard Japanese issue from the beginning of the war. The subsequent Type 96 and Type 99 could not fulfill the demand and forced to continue the deployment of the Type 11 until the end of the war.

[50] Reference 13, Vol. I, p. 239.

Many Chinese guerrilla forces also obtained Type 11s from various sources. The advantage was that it used the same cartridges as the Type 38 rifles that they often obtained at the same time.

In addition to the small quantity produced in the Northeastern Three Provinces Arsenal, China also purchased a certain amount of Type 11 via Taihei. However, there wasn't a large number left when the war broke out.

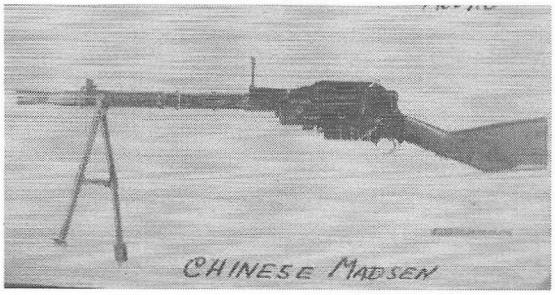
Picture 339 During the 128 Shanghai Incident, a Chinese soldier is firing a Type 11. Courtesy of Leeland Ness.



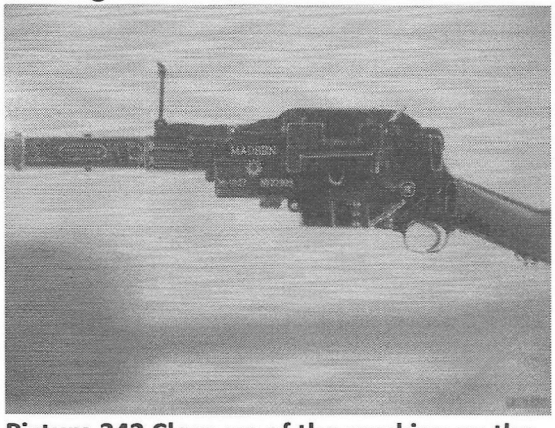
Picture 340 The hopper system of the Type 11.[51]

Section 3. Imported Light Machine Guns

I. Danish Madsen Light/Heavy Machine Gun



Picture 341 A Chinese contract Madsen light machine gun. Note the Nationalist Sun marking on the receiver. Source B.



Picture 342 Close-up of the marking on the Chinese contract gun. Source B.

Picture 343 A Madsen gun trial held in Shanghai right before the War. The Madsen in the photo was mounted on the "Soft Mount" tripod and served as a heavy machine gun. Combined Logistics Command photo.

Madsen Light Machine Gun Specifications
Operation Method：Long Recoil
O/A Length：1,160mm
Barrel Length：477.5mm
Caliber：7.92x57mm

[51] Reference 13, Vol. VI, p. 282.

Weight：9.6kg
Muzzle Velocity：690m/s
Feed：32-round box magazine
Rate of Fire: 450-500 r/m

The Madsen machine gun was first adopted in Denmark in 1904. There were many minor improvements over the years and it continued to serve in various military forces well into the 1950s.

The Madsen operating system was unique, employing the long recoil principle in which the recoil distance is greater than the cartridge length. The receiver contains a loading lock to ensure that the barrel returns to the proper distance before loading a round. Fundamentally this would slow down the rate of fire.

During operation, the bolt moves vertically during the firing cycle, similar to a Martini type of locking mechanism. The extractor, ejector and loading arm are all separate components. It was fairly complicated in design and that translated into a higher production cost. Many people had "proven" that this mechanism would never work but the Madsen actually was one of the most reliable machine guns.

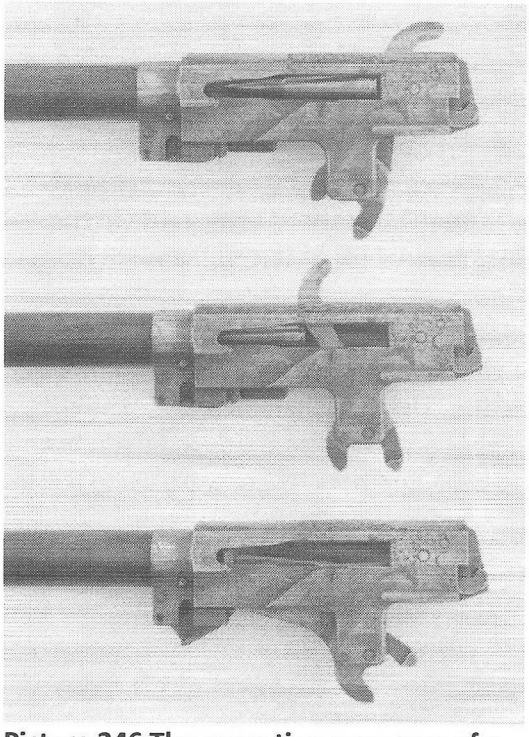
Picture 344 The Madsen copy made in the Kaifeng Arsenal (開封兵工廠). Source A.

The production of the Madsen in China started in Guangdong Arsenal in 1909. It was called the "Light Machine Cannon" (輕機快砲). Other arsenals also produced them but not in large numbers. There were some still in service during the war.

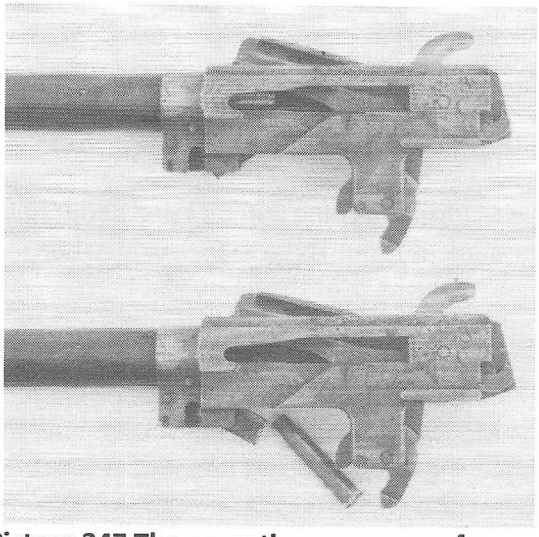
Picture 345 Soldiers demonstrate the way to transport the gun and the mount. The soldier on the left has a big white bottle. It's a gunner water bottle and when the barrel got too hot, he was to pour water over the

barrel to cool it down. Combined Logistics Command photo.

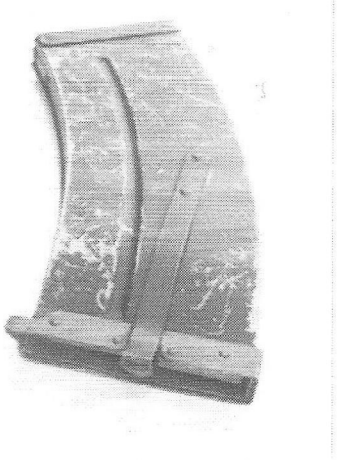
In 1939, a Danish Colonel, Halvor Jessen, published a study regarding universal machine guns titled: "The Modern Battlefield and Precision – and the Universal Machinegun". It praised the soft mount tripod the Madsen used. This caught the attention of the German military and they eventually produced the Lafette tripod for the MG 34 and MG 42 machine guns.



Picture 346 The operating sequence of a Madsen machine gun (1). Top: the magazine is inserted from the top but it is in a slot on the left side of the receiver. The barrel extension contained a cartridge shaped opening. Middle: once the cartridge enters the opening, a feeding arm pushes it forward into the chamber. Below: the bolt rises to lock the chamber, lines up with the cartridge and is ready to fire. The firing pin is struck by the hammer on the right side of the bolt and the cartridge fires.



Picture 347 The operating sequence of a Madsen machine gun (2). Top: after the round is fired, the barrel and barrel extension recoil and the bolt rises to unlock and clear the chamber. Below: note the extractor on the lower left bottom side, extracting the empty cartridge case and ejecting it out of the bottom of the receiver. The movement of the various parts is accomplished by several raised sections on the receiver wall.



Picture 348 A Madsen 30-round magazine. Note that the magazine clip also serves as the cartridge stop.

The traditional machine gun tripod employed weight to counter the recoil. The "soft mount" employs spring power to tame the recoil and the gun is "floating" on the mount. For this reason the "soft mount" has greatly

reduced weight but still provides good stability for long range firing.

The Ordnance Office decided to adopt the Madsen machine gun after Brno declined a license for ZB-26 production in China. The Madsen chosen was to have the "soft mount" and be deployed in dual roles as both a light and heavy machine gun –the universal machine gun. A contract was awarded to Madsen and drawings, tooling, jigs and machinery were purchased to prepare for large scale production.

Picture 349 The "soft mount" tripod of the Madsen gun.

One flaw in using the Madsen as a heavy machine gun was that it's magazine fed and could not provide sustained fire like a belt fed gun. However, it is obviously on a par with the Japanese Type 38, Type 3 and Type 92 guns using a 30-round feed tray. It also didn't have a quick change barrel feature. The picture above shows the gunner's water bottle carried by the gunner to address this issue.

The decision to produce large numbers of Madsen domestically was made in March 1938, and the preparations office was set up in April 1939.

Then the war erupted in Europe and it made the machinery acquisition more difficult. The Burma road transportation capacity was also limited. In June, 1940, the full set of tools and jigs along with the drawings were lost in a Japanese air raid on a Burma Road depot. This plan was then voided and the Ordnance Office had to turn back to ZB-26 production.

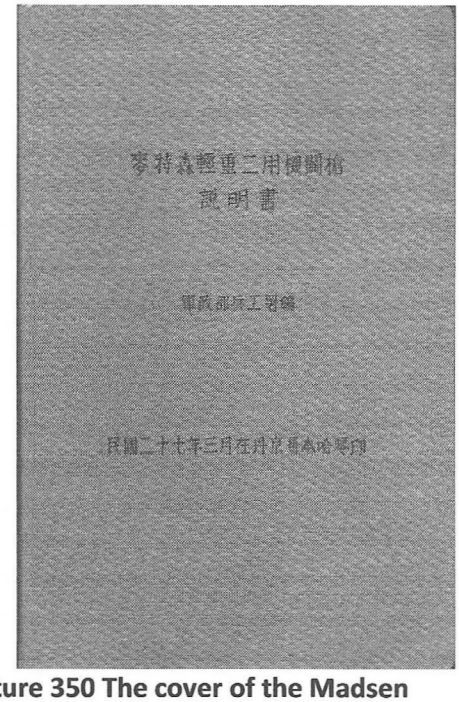
Madsen machine guns procured before the war[52]		
Time	Quantity	Importer
1906	30	Bielefeld & Sun
1907	14	Bielefeld & Sun
1908	40	Bielefeld & Sun
1909	27 (Pistol)	Bielefeld & Sun
1911	1	Benny Spiro
1912	30	Various
1913	9	Bielefeld & Sun
1930	3	Carlowitz
1931	200	Simonetta
1931	18	Flygindustri (Aircraft, Sweden)
1935	66	Siai + Caproni (Aircrafts)

Acquisition during the war[53]		
Date	Quantity	Receipt #
16-Mar-38	50	1720
16-Apr-38	100	1740
18-May-38	100	1756
18-Jun-38	50	1777
6-Jul-38	100	1791
5-Aug-38	100	1807
28-Aug-38	100	1821
13-Sep-38	100	1839
28-Sep-38	100	1848
10-Oct-38	100	1855
9-Nov-38	100	1874
29-Nov-38	100	1884
21-Dec-38	100	1897
14-Jan-39	100	1910
4-Feb-39	100	1922
25-Feb-39	100	1929

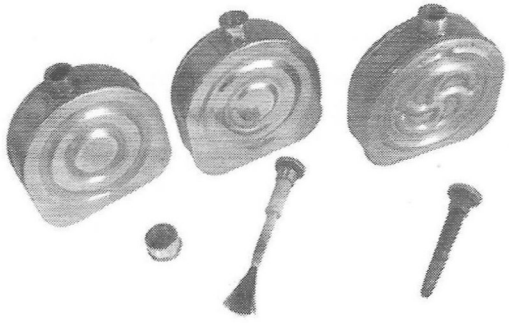
[52] Data came from an ex-Madsen worker, the numbers pretty much match with the Hong Kong Custom figures.

[53] Same as above footnote.

25-Mar-39	100	1939
1-Apr-39	100	1949
29-Apr-39	100	1962
13-May-39	100	1974
27-May-39	100	1987
10-Jun-39	100	1997
1-Jul-39	100	2012
29-Jul-39	100	2026
14-Aug-39	100	2033
10-Oct-39	100	2064
10-Oct-39	100	2065
26-Oct-39	100	2085
14-Nov-39	100	2097
7-Dec-39	100	2114
16-Jan-40	100	2208
7-Feb-40	100	2229
6-Mar-40	100	2252
18-Mar-40	100	2269
Total	3,300	



Picture 350 The cover of the Madsen machine gun Chinese instruction manual. The title states its dual role as light machine gun and heavy machine gun. Printed in Copenhagen, Demark.



Picture 351 The two oil bottles made by Madsen on the left and the one made by the 51st arsenal in China. The face of the bottle bears the arsenal markin of the 51st. Apparently some machinery did arrive.

II. Canadian John Inglis Bren Light Machine Gun

Picture 352 A 303 caliber Mk I*. The magazine is curved and it can hold 30 rounds. Robert W. Faris collection.

Bren Light Machine Gun Specifications

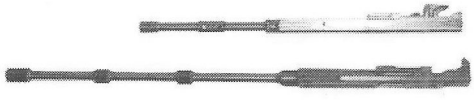
Operation Method：Gas operated
O/A Length：1,190mm
Barrel Length：635mm
Caliber：7.92x57mm
Weight：10.5kg
Muzzle Velocity：830m/s
Feed：20-round box magazine
Rate of Fire: 500 r/m

In 1932 Great Britain held a light machine gun trial in search of a replacement for the Lewis gun. Brno participated in the trial with the ZB-33 and eventually won. Britain purchased the right to manufacture the gun domestically with a few changes of their own. The name BREN came from the first two letters of Brno and Enfield. It went into production in September, 1937.

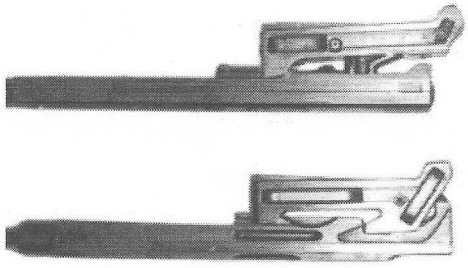
The John Inglis Company in Canada also produced the Bren during WWII to supplement the war effort for Commonwealth Nations.

Comparison between the Bren vs the ZB-26/30

- Bren & ZB-30 both shortened the operating rod and the striker was moved to the middle position of the bolt carrier section.
- Bren used the 303 cartridge and a curved 30 round magazine.
- Bren deleted all the cooling fins on the barrel.
- As with the ZB-30, there is a gas adjustment knob but in a different location.
- The rear sight of the Bren was turned 180 degrees to increase the sight radius. The Mark II further changed the rear sight to a receiver top mounted peep sight.
- Bren Mark I added left hand handle which was later deleted.



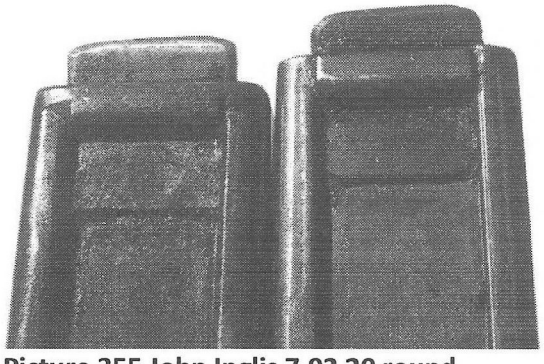
Picture 353 Operating rod comparison between the Bren and the ZB-26. Top: Bren, it is shorter and moves the firing pin striker from the very right(see below) to the middle of the carrier section.



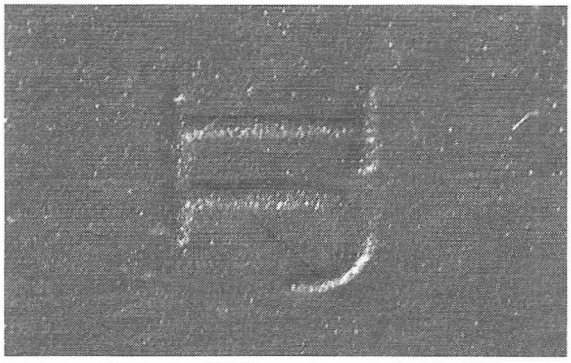
Picture 354 Comparison of bolt and operating rod in both Bren and ZB-26. Both are in the locked position. Top: Bren.

Under the US Lend-Lease Act, the US government committed to supplying Bren light machine guns to China. The first group were in 303 caliber and totaled 18,135 guns with cartridges, spare barrels and magazines. This would actually introduce another caliber into China and further complicate the already complicated supply problem.

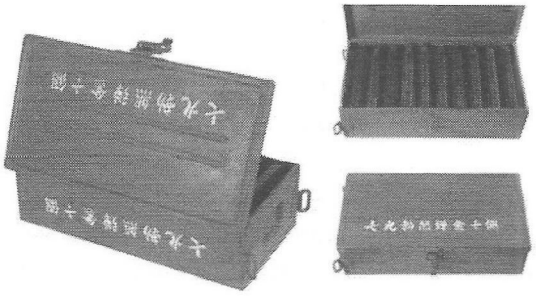
After Canada enacted the War Appropriation Act program, China requested Bren guns under that program. In October 1943, Inglis started the production of Bren guns in 7.92 caliber. Between 1943 and the end of the war, John Inglis Company shipped 18,900 Bren Mark II light machine guns.



Picture 355 John Inglis 7.92 20 round magazine and Brno 7.92 20 round magazine. The John Inglis magazine is on the left. Note the extra weld mark. The magazines are interchangeable on ZB and 7.92 Bren guns.



Picture 356 The "JL" mark on John Inglis made magazines on the magazine ridge.



Picture 357 John Inglis produced carrying case for 10 magazines with Chinese markings.

The original plan was to equip the strategic reserve troops in Chungking area with these guns. However, the Burma Road cut-off prevented these guns from reaching China. Only 1,117 guns had arrived in China by the beginning of 1945. By July 1945, 13,806 guns had arrived in China.

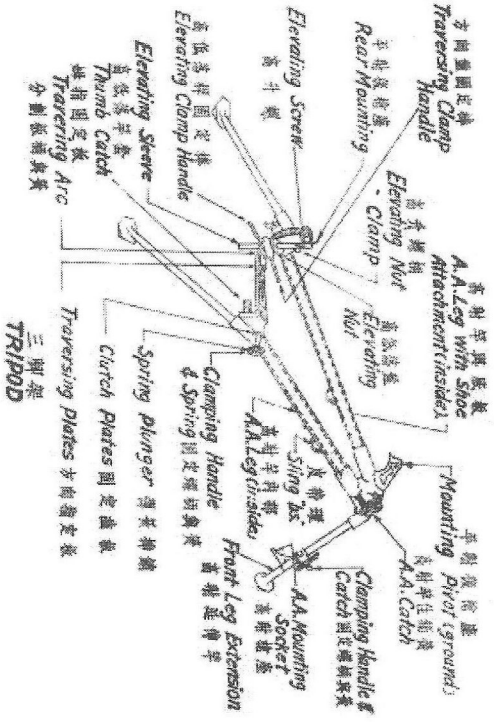
Canadian Bren Gun Shipments to China	
Date	QTY
1941	1,750
6/6/1942	1,500
7/28/1942	500
8/28/1942	1,237
10/28/1942	1,500
11/27/1942	1,500
12/26/1942	1,500
1/22/1943	1,650
2/25/1943	1,650
3/19/1943	1,350
4/22/1943	2,500
5/22/1943	1,498
Total	18,135
Bren acquisition under US Lend-Lease Act	

The primary troops equipped with these 303 Bren guns were the X-Force in India. The Y-Force was only equipped with one company per regiment. Most of the guns didn't arrive in time for the Burma Campaign for the Y-Force.

The Inglis guns were marked on the right side of the receiver either "BREN Mark II Inglis 1944" or
"79 Bren Made in Canada" in Chinese.

Picture 358 Inglis made Bren with "79 Bren Made in Canada" (七九勃然 加拿大造) markings on the receiver in Chinese. Source B.

Picture 359 The X-Force troops returning to camp after a day's exercise, April, 1945. The two soldiers in the lead have Bren Mk IIs on their shoulders. Source A.



Picture 360 A page from the X-Forces training manual on the Bren tripod, Chinese edition.

Picture 361 A Bren Mk I on its tripod.

III. Finnish Lahti M26 Light Machine Gun

Picture 362 The Finnish M26 in 7.62x54R. Courtesy of Jari Lemmetyinen.

M26 Light Machine Gun Specifications
Operation Method：Short recoil
O/A Length：1,180mm
Barrel Length：500mm
Caliber：7.92x57mm
Weight：9.3kg
Muzzle Velocity：~810m/s
Feed：25-round box magazine
Rate of Fire: 550 r/m

The M26 was designed by the famous Finnish gun designer Aimo Lahti and possibly assisted by AE Saloranta. It was adopted by the Finnish Army in 1926.

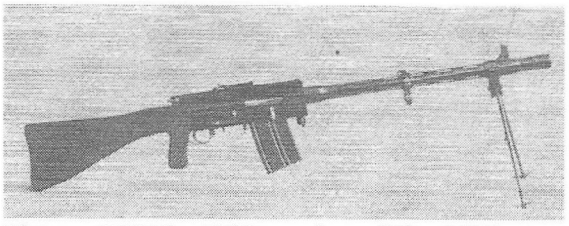
The Lahti was the first true light machine gun. It had all the features such as a bipod, quick change barrel, select fire capability and box

magazine. The guns were made to very close tolerances, having good quality and very high accuracy. However, it was sensitive to dust and prone to malfunction if not maintained properly. At the same time, in the two wars with Russia, Finland had captured over 8,000 DP machine guns and Finnish troops actually preferred the DP over the M26. Eventually the DP became the mainstay of the Finnish Army.

The M26 is capable of quickly changing the barrel. There is a release ring at the end of the stock, and the stock can be removed after the ring is rotated 180 degrees. After the stock is removed, the top cover can be opened, and the bolt, barrel extension and barrel can be removed. It is obviously not as convenient as some other designs but the manual stated that it could be accomplished in 7-8 second. Regardless, taking out all the working mechanism of the gun under dusty combat conditions is not a really good idea.

Finland produced around 5,000 guns for the Army. It was planned to offer the gun on the international market. The barrel, barrel extension and bolt are the only three parts that need to be changed to change the caliber along with the magazine. In addition to the original 7.62x54R caliber, it offered kits for the 303 and 7.92 cartridges in the hopes to attract international buyers. The marketing literature suggested that soldiers should bring the kit suitable for the enemy's caliber so that if they capture a large quantity of enemy ammunition they can switch caliber!

The only buyer was China who was in desperate need for arms at the beginning of the war. A contract was signed to purchase 30,000 guns but the Japanese intervened. There were only 800 guns delivered to China in 1938.



Picture 363 The 7.92 version of the M26. Note the magazine difference. 1933 Valtion Kivaaritehdas factory instruction manual.

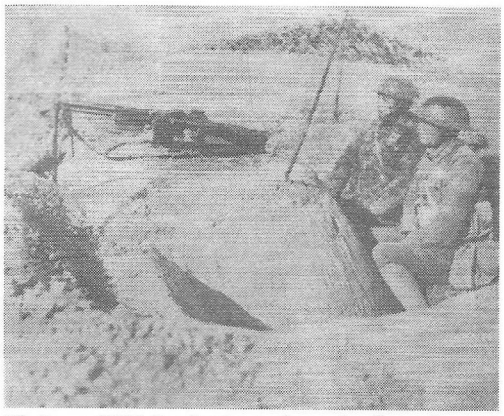
IV. FN Mle 1930(FM 30) Automatic Rifle

Picture 364 The FN Mle 1930. Source B.

FN Mle 1930 Light Machine Gun Specifications

Operation Method：Gas operated
O/A Length：1,130mm
Barrel Length：550mm
Caliber：7.92x57mm
Weight：9kg
Muzzle Velocity：800m/s
Feed：20-round box magazine
Rate of Fire: 550 r/m

Browning obtained a patent on the Browning Automatic Rifle in August, 1917. It was adopted by the US Army and first used in WWI in 1918. The original intent was to issue the rifle to infantry men and use the firepower of an automatic rifle to clear the trenches. However, due to its weight, it was found that it was not suitable as a general issue rifle. With further development, it became the squad automatic weapon widely known as the BAR in WWII.

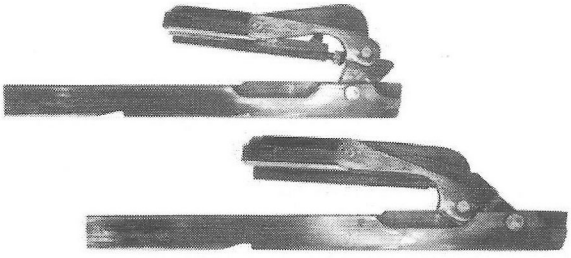


Picture 365 A photo taken during the Wuhan (武漢) Defensive, circa June to October 1938. It shows an automatic rifle position maned by two soldiers. Da Mei Periodical, Vol 2, Issue 6.

Picture 366 Yunnan troops under General Long Yun in parade, Kunming 1945. The troops wear the French Adrian helmets and carry FN Browning Automatic Rifles. Source D.

FN produced an improved version of the Browning Automatic Rifle under the designation Mle 1930 and offered it on the international market. The FN version added a gas adjustment, a dust cover, a rate of fire adjustment and a pistol grip. The FN version parts are not interchangeable with the US version. The Mle 1930 is more of a light machine gun.

Picture 367 Another picture of Long Yun's troops. This is an Automatic Rifle Squad. From Shen Newspaper (申報) 1937.



Picture 368 The bolt and operating rod of the FN 1930. Locked position on top and unlocked position below with the operating rod pulled back

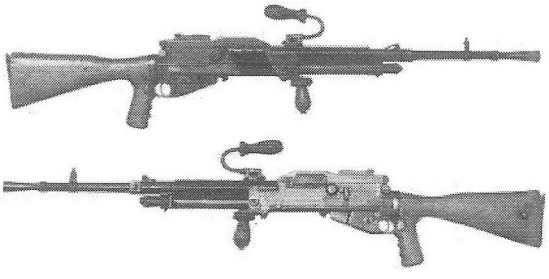
FN offered the FN 1930 in several different calibers and was very successful. China imported many of these guns through various authorities in addition to the Nationalist Government. It is known that at least Shenxi Arsenal produced small numbers of this gun locally.

In 1933, China imported 1,771 FN 1930 in the first half of the year. The Finance Ministry imported 5,000 guns in total and 2,000 were still in inventory at the end of 1934. By the time war broke out, 9,148 guns had been imported. After that the Nationalist Government purchased another 8,000. By May 1939, there had been 7,412 guns delivered via the Burma Road.

Picture 369 The FN 1930 in action in the Cheng De (常德) Campaign, circa 1943. The Second China Historical Records Library.

Picture 370 A well traveled FN 1930 captured by US troops in the Pacific theater. It was first captured by Japanese troops and taken by them to the Pacific islands. Source D.

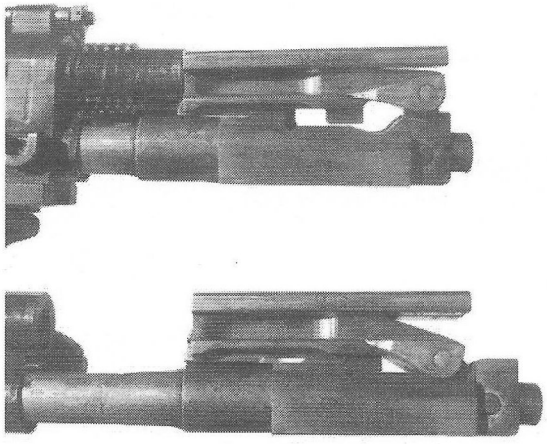
V. French 1922 Hotchkiss Light Machine Gun



Picture 371 Hotchikiss light machine gun manufactred after WWII. This one is missing the bipod and has an added front grip.

Hotchkiss Light Machine Gun Specifications
Operation Method：Gas operated
O/A Length： 1,150mm
Barrel Length：550mm
Caliber：7.92x57mm
Weight：8.5kg
Muzzle Velocity：790m/s
Feed：30-round strip
Rate of Fire: 300-350 r/m

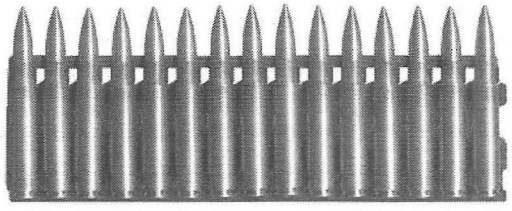
Hotchkiss produced the first light machine gun in 1909 based on the same action used in its heavy machine gun. It wasn't a very successful product and Hotchkiss went back to focus on heavy machine gun production for the French army. After WWI, Hotchkiss produced the 1922 model. It was still a basic Hotchkiss design and again was not very successful. It wasn't adopted by even the French army.



Picture 372 The bolt and operating rod of the Hotchkiss light machine gun. Locked position on top and unlocked position with operating rod pulled back on the bottom.

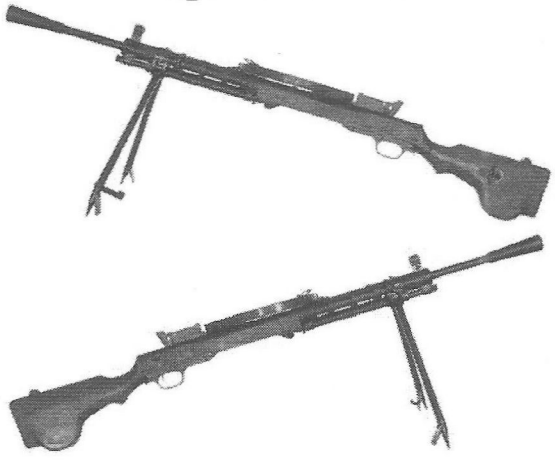
China started procurement of the Hotchkiss 1922 light machine gun in 1931. By the time war broke out, China had already imported 2,620 guns. After that, China continued to acquire this model. In November 1937, 1,400 were ordered. By 1939, 925 guns had come in via the Burma Road. The Guangxi government also purchased 500 guns in 1938.

Picture 373 In the suburb of Taiyuan, Shenxi, 1937. Two soldiers are firing a Hotchikiss light machine gun in the anti-aircraft position. The Second China Historical Records Library.



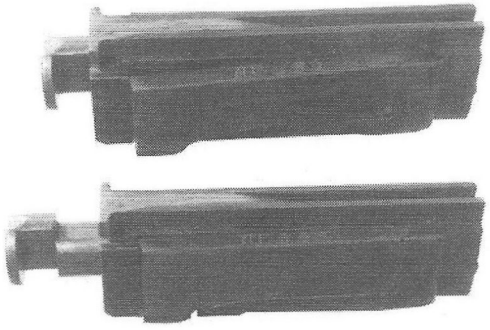
Picture 374 Ammunition feed strip used by all Hotchkiss guns.

VI. Russian Degtyarev Pakhotnyi DP-27/DP-28 Light Machine Gun



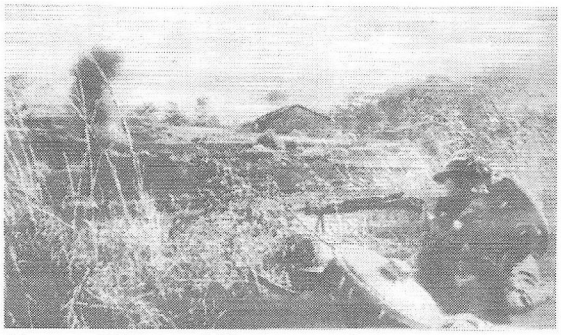
DP-28 Light Machine Gun Specifications
Operation Method：Gas operated
O/A Length：1,275mm
Barrel Length：605mm
Caliber：7.62x54mmR
Weight：9.2kg
Muzzle Velocity：840m/s
Feed：47-round pan magazine
Rate of Fire: 600 r/m

The DP light machine gun was one of the simplest and most reliable light machine guns in the world. The only design flaw was probably the pan magazine it used, which was difficult to carry and load. The main spring was directly under the barrel so heat from the barrel adversely affected its long term durability.



Picture 375 The DP bolt with the locking flaps. Top: when the bolt is in locked position, the flaps extend out of the bolt and lock into the recesses in the receiver. Below: when the bolt is retracted, the firing pin is pulled out of the bolt so the flaps are returned back to their housings and are flush with the bolt to unlock the gun.

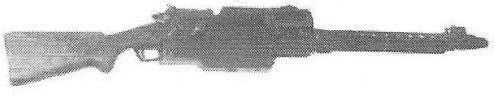
The DP uses two simple flaps as the locking mechanism. When the flaps are extended, they lock into recesses in the receiver wall. When the flaps withdraw, the gun is unlocked. This mechanism was first patented by a Swedish inventor, D.H. Friberg, in 1870. However, he didn't actually produce a working model. It was not until 1907 when Rudolf H. Kjellman actually produced a heavy machine gun employing this principle. The later German Gewehr 43 and MG 42 all used a similar mechanism in their designs.



Picture 376 A soldier operating a DP-28 in Chun Hua (純化), Guangdong. Liang You #144.

Under the Russian Aid program at the beginning of the war, China received 5,600 DP light machine guns starting in March 1938. It was immediately pressed into services in the Tai Er Zhuang Campaign in 1938. A soldier from the 27th Division wrote later: "Our division was three-three organized (three platoons to a company, three companies to a battalion, etc). My company had about 120 men and was well armed. I was a Squad Leader. There were 14 men in my squad divided into two teams – one was a machine gun team with a Russian 762 "rotating pan machine gun", the other was a rifle team armed with Hanyang rifles."[54]

VII. Russian Model 1925 Maxim-Tokarev Light Machine Gun



Picture 377 Maxim-Tokarev light machine gun with the bipod in folded position. Beijing Military Museum.

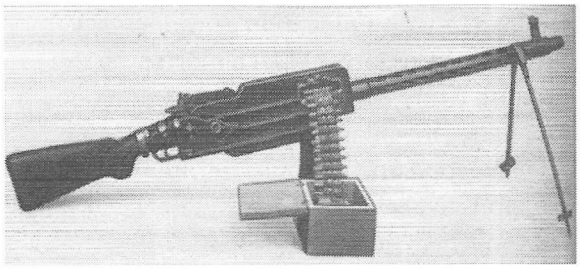
Maxim-Tokarev Light Machine Gun Specifications
Operation Method：Recoil operated
O/A Length：1,300mm
Barrel Length：721.7mm
Caliber：7.62x54mmR
Weight：13kg
Muzzle Velocity：850m/s
Feed：100-round cloth belt in a drum or regular Maxim 250-round belt
Rate of Fire: 100-300 r/m

This gun was designed by Fedor Vasilevich Tokarev in 1925. It was basically a simplified, lightened Russian Maxim heavy machine gun. Russia didn't have a native light machine gun design in production during WWI but utilized some foreign models available at the time. After the Communist Government stabilized the Soviet Union in 1920s, this void became a high priority to fill. This design was adopted in 1925. Basically Tokarev deleted the water jacket, switched to a bipod, simplified the receiver and added a quick change barrel mechanism. However, troop trials showed that it was still too heavy to carry and more improvement needed to be made. He made further modifications in 1927. However, in front of the Review Board, he stated that it wasn't a good idea to put the new version into production because this was already an obsolete design. The Russian military switched to the DP series and abandoned the M-T light machine gun.

Russia produced 2,450 guns between 1926 and 1927, when production ceased. The Russian Aid program sent 1,400 guns to China between 1938 and 1939, over half of the total produced. The rest of them were sent to civil war ravaged Spain around the same time. It's said that there is no record or photo showing that the M-T drum was sent to Spain. From the photo above, they were sent with the guns to China.

---

[54] The personal account in Tai Er Zhuang front line, Cheng Yu Liang (鄭玉良)，Xu Zhou Literature & Historical Records (徐州文史資料),Issue 5.



Picture 378 Soviet supplied Maxim-Tokarev light machine gun in Spanish Civil War.

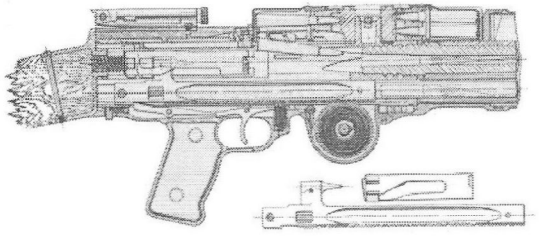
In the later war with Finland, Russia suffered great loss and casualties. The M-T light machine gun was used and may have been captured by the Finnish, but it could not have been any great number because there were not that many left in Russia to begin with. China may be the country with the greatest number of this gun today.

VIII. British Lewis Light Machine Gun

Lewis Light Machine Gun Specifications
Operation Method：Gas operated
O/A Length：1,250mm
Barrel Length：660mm
Caliber：.303 British (7.7x56mmR)
Weight：12kg
Muzzle Velocity：747m/s
Feed：47/97-round pan magazine
Rate of Fire: 700 r/m

Fan Chongshi (范崇實) used to work for Liu Xiang. He recalled that between 1928 and 1930, he personally dealt with three groups of arms purchases. The third group consisted of 3,000 British Lewis guns and 15 million round cartridges.

Isaac N. Lewis was a US Army Colonel, who patented the gun in 1911. The US Army was not interested in the gun at that time. He retired from the Army and brought the gun to Belgium. He was received with huge enthusiasm and the gun was put into production immediately. The Birmingham Small Arms Company (BSA) in Britain also acquired a license to produce the gun shortly thereafter.



Picture 379 Section view of the Lewis gun and its bolt.[55]

The Lewis gun was adopted by the British in 1915 and was not replaced by the Bren until the late 1930s. The two distinct features of the Lewis gun are the large ventilation jacket around the barrel and the pan magazine. The ventilation jacket in theory utilized the muzzle blast to draw air through the jacket to cool the barrel. In reality it actually didn't do much. The British Army test showed that it didn't make any significant difference with it or without it. The pan magazine had two different versions, the 47-round version was for ground use and the 97-round version was for aerial deployment. The pan actually turns when it is in use, unlike other pan magazines that use a wound spring to push the cartridges into place. The Lewis magazine has no spring.

The Lewis gun was the standard machine gun issued to Japanese Naval Aviation units in

[55] Reference 13, Vol. I, p. 280.

caliber 7.7x58mmR. It was fairly rare in China at the time.

Picture 380 The loading of the Lewis's pan magazine. Second from the left, a round is inserted and as the axis rotates, the round spirals down into the magazine. Upon firing, the cartridges follow the reverse order and are fed into the gun.

Section 4. Combat Experiences and Comments

"The fourth squad machine gunner Zhao Dekui (趙得魁) with an ammunition bearer, rushed through the trench between the second platoon and the third platoon, going after the enemy's heavy machine gun. They forced it to change position three times and eventually eliminated it."

The seven days and seven nights holding Hu Lao Guan (虎牢關), ZhongYuan Campaign (中原抗戰)

China started deploying light machine guns in quantity during the Northward Expedition period. It was a time that lessons learned in WWI turned into practice. The assault team and automatic weapon combination was introduced into the Chinese Army's organization by the German advisors, among others.

The characteristics of the light machine gun:

- in rifle caliber
- weight between 7 to 14 kg and can be easily transported with troops
- shoulder fired but mostly fired from a prone position
- equipped with a bipod
- can be operated by one person but most likely a two-men team to carry extra ammo, spare barrel, and such.

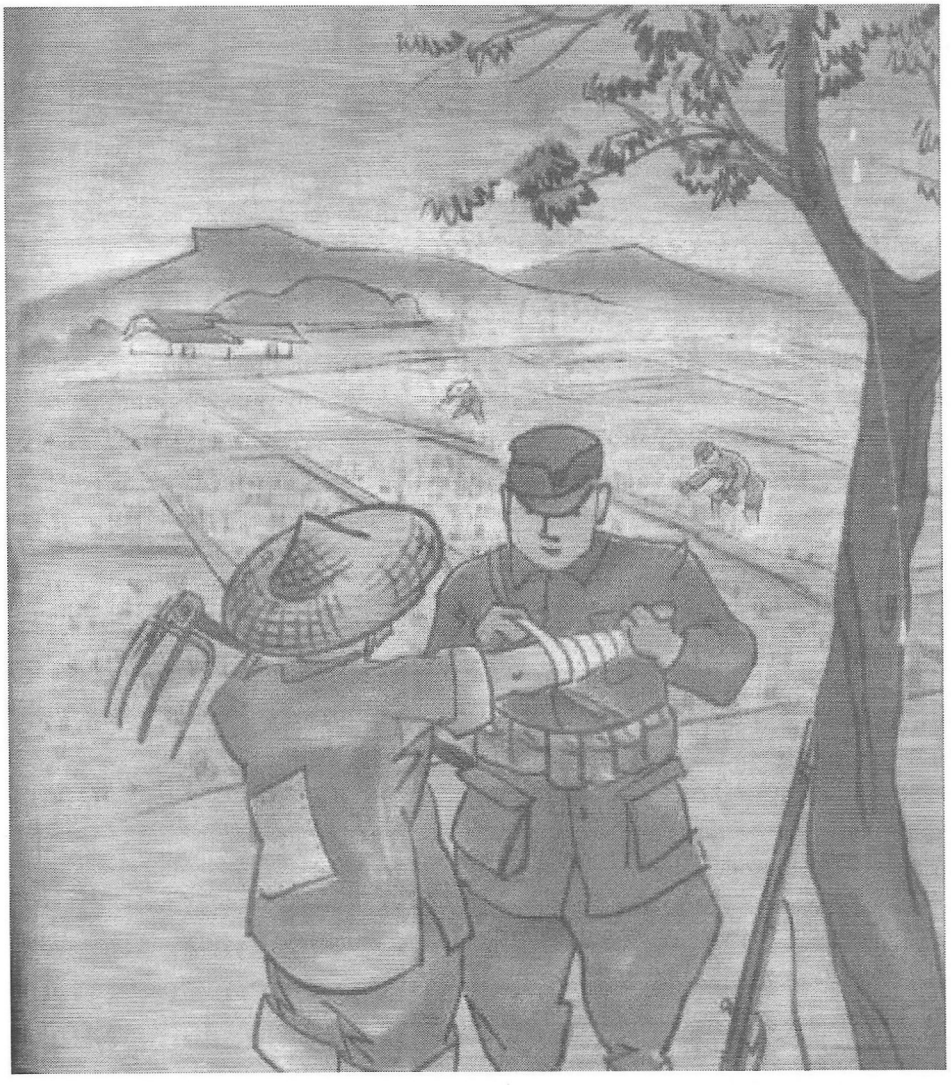
During the war, China didn't produce any artillery pieces larger than a mortar, so the Chinese Army was vastly short of firing power. The heavy machine guns were a battalion level weapon and the only automatic weapons available at the company level were light machine guns or automatic rifles.

The ideal TO&E called for one light machine gun per squad. It was not a reality. Some of the local origin troops had a lot less. In general, most front line infantry platoons did have two to three light machine guns. These were under the control of the platoon and company commanders. Because these were the only automatic weapons in small infantry units, they were put to use with devastating effects. Ex-Japanese soldiers who fought in China often wrote in their memoirs about the terrible "Czech" guns.

Light machine guns used the same cartridge as the riflemen and they operated together. They could share the available ammunition and adjust the distribution. Light machine guns were target weapons. They could follow the movement of enemy troops and acquire targets as they present themselves. It could also form cross fire patterns nicely with two or more guns. Light machine guns could also cover each other while changing a magazine or barrel. There wouldn't be any interruption of fire that the enemy could use to advance.

The light machine guns in service by the Chinese troops during the war, for the most part, were in 7.92 caliber even thought the model might be different. This certainly reduced the supply problem to a large degree. The ZB-26 was a very well designed weapon in its own right and the fact that they were produced in large numbers domestically eliminated the training, spare parts and maintenance issues.

Picture 381 Type 41 light machinegun made in Taiwan as the last of the ZB saga. It was identical to the Bren but in 30-06 caliber. Source F.



Chapter 6. Heavy Machine Guns

Section 1. The Organization of the Chinese Army Heavy Machine Gun Company

Picture 382 A proud Chinese machine gunner shoulders a Type 24 machine gun and still manages a broad smile. This might have been the first time he had a photo taken. Source A.

In June 1932, the Nationalist Government created a provisional TO&E for the army division. The organization chart listed three battalions to a regiment and each battalion consisted of a machine gun company. The August 1935 "Model Division" TO&E was the same. The 1935 "Consolidated Division" TO&E returned to the two brigades and four regiments organization in which each regiment had a machine gun company. The 1936 "Adjusted Division" TO&E changed back to the battalion machine gun company organization. The 1st Battalion of the 88th Division, 262nd Brigade, 524th Regiment, defending the "Si Hang Warehouse" in Shanghai consisted of three infantry companies and one machine gun company. There were two guns set up on the roof in an anti-aircraft role and the rest were distributed among the infantry companies.

A "standard" machine gun company had three platoons and six squads. Each platoon had a driver leader and eight horses. Each squad had about 12 men including one gun leader, six gunners, four drivers and one messenger. At deployment, there would be an ammunition squad attached to each platoon which consisted of one squad leader, one corporal, two drivers, two horses, four backup gunners and one repair specialist. There were armorers, an iron specialist, an observation specialist and a carriage specialist in the company headquarters.

The machine gun company might also have a communication squad attached with communication specialists, drivers, etc., totaling 12 people with two field phones and wire.

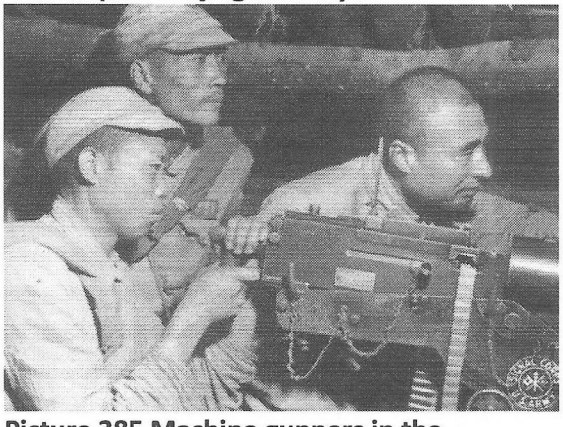
The daily machine gun ammunition supply unit was set at 2,000 rounds per gun and the monthly supply unit was 20,000 rounds.

Picture 383 The Chinese Central Army in anti-aircraft exercises in Suiyuan. Note that there are seven men per gun and they're all covered with camouflage netting. Lian You #130.

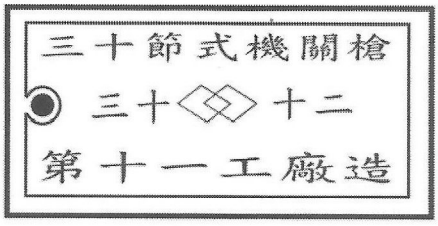
Section 2. Domestically Produced Heavy Machine Guns

I. Hanyang, Huayang, and Shanghai produced Type Triple-Tens Water Cooled Heavy Machine Gun

Picture 384 The Type Triple-Tens water cooled heavy machine gun. This one was most likely from Hanyang judging by the tripod adjustment knob. The cradle was the original Browning designed model and marketed by Colt with the Model 1919 commercial model. It was also known as the M35 Tripod. Beijing Military Museum.



Picture 385 Machine gunners in the Tengchung campaign, a push to reclaim Burma. Note the factory identification plate in the lower center of the receiver. It indicates that this gun was made by the 11th Arsenal in December 1941. This seems to be the location where all Type Triple-Tens attached their identification plates. Also note that the charger handle has a chain attached which implies that it could be easily pulled out and the chain was there to prevent it from being lost. There is a small housing on the cradle to accept the detached handle. Source D.



Picture 386 The characters on the identification plate. Top: Type Triple-Tens machine gun; middle: December, 1941; bottom: made by the 11th Arsenal.

Type Triple-Tens Heavy Machine Gun Specifications

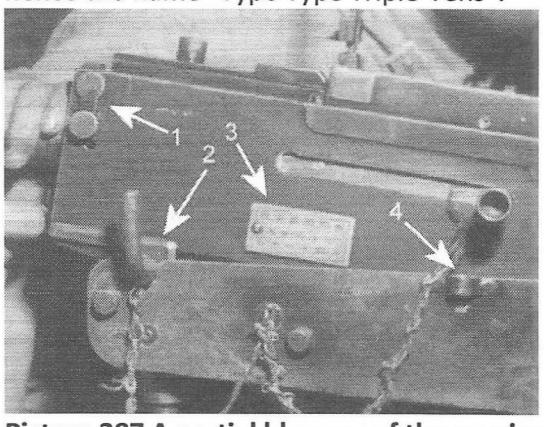
Operation Method： Recoil operated
O/A Length： 960mm
Barrel Length：610mm
Caliber：7.92x57mm
Weight：15.6kg
Muzzle Velocity：824m/s
Feed：250-round cloth belt
Rate of fire: 500-600 r/m

The Type Triple-Tens was a copy of the US Colt 1917 heavy machine gun. The gun was originally designed by John Browning, and was the main heavy machine gun used in WWI by US troops. During WWII, it was still widely deployed especially in the Pacific theater by the US Marines. The modified air cool model 1919A4 became the primary light machine gun for US troops in WWII.

The origin of the Type Triple-Tens in China, according the Superintendent of the Hanyang Arsenal, Yang Wenkai (楊文愷)[56], was due to an unidentified American arms dealer who tried to sell a Browning machine gun to the warlord Wu Peifu (吳佩孚). Wu asked Yang of his opinions. Yang replied that they could

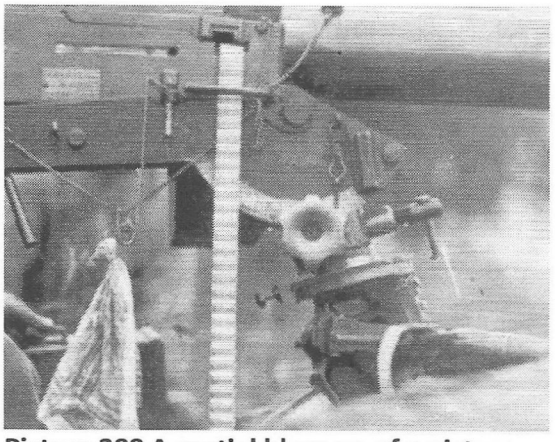
[56] Tientsin Literature & Historical Records, Issue 41, p. 204,"My relationship with Cao and Wu when I was in Hanyang"：Yang Wenkai

copy it. Wu threw the dealer in jail with the charge of smuggling arms and gave the gun to the Hanyang crews. After a few months of reverse engineering, it was successfully copied. Wu released the dealer and returned his gun. Hanyang started series production on October 10, 1921, which was the 10th day, 10th month and 10th year of the Republic; hence the name "Type Type Triple-Tens".



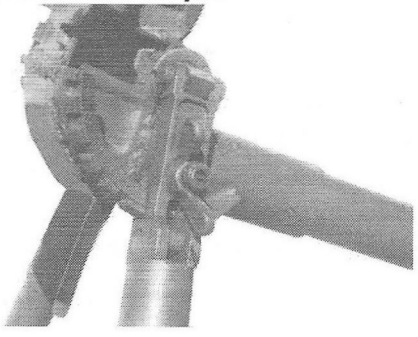
Picture 387 A partial blow-up of the previous picture. There are four distinct features of the Type Triple-Tens: 1. Disassembly knob, 2. Receiver bottom tripod attachment, 3. Factory identification plate, 4. Charger handle keeper.

It is unclear what the exact model was that the Type Triple-Tens was based upon. If the story is true, the dealer couldn't have been a legitimate arms dealer. He was probably just a traveling salesman trying to make some quick money. The model most likely was a Colt commercial 1919 judging from the tripod.

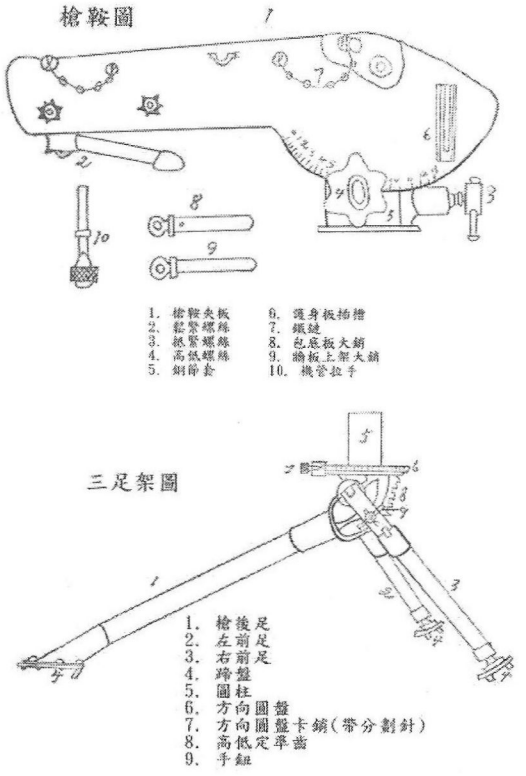


Picture 388 A partial blow-up of a picture taken during the 128 Shanghai Incident. The handle is inserted into the keeper on the cradle. Note the tripod has "teeth" in the front similar to the Type 24. The cradle knob to secure the cradle is different from the Hanyang version. The factory identification plate shows that this was produced by Shanghai Arsenal. Courtesy of Leeland Ness

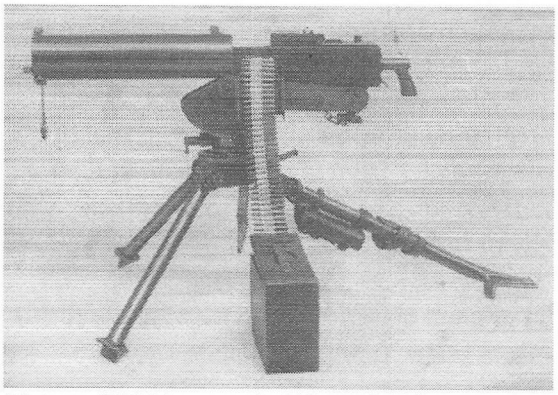
Picture 389 A view of the tripod from the left side from rear. Note the cradle knob is the Hanyang/11th Arsenal style.



Picture 390 A Type 24 tripod viewed from the left front. The mechanism is similar to the above tripod.



Picture 391 The Type Triple-Tens' cradle, tripod and shield. No one has yet seen a picture of a Type Triple-Tens with a shield in place. Reference 36.



Picture 392 Very early US M1917 heavy machine gun with the original Browning cradle. The Type Triple-Tens looked very similar to this model.[57]

After the M1917 was adopted in the US, there were few changes made to it. However, there were a host of various tripods and cradles in use at one time or another. Colt produced a commercial version and called it the 1919. It used the original Browning designed cradle. It was later called the M35 Tripod and was very different from the 1917 and 1917A1 used by the US military. The Type Triple-Tens used a cradle similar to the M35 but the tripod again was different. It was more similar to the Maxim 1909 type of tripod with quick locking legs. All the US tripods had the legs with a different locking mechanism.

Picture 393 A US 1917A1 tripod. As can be seen in this picture, it has a totally different type of leg locking mechanism.

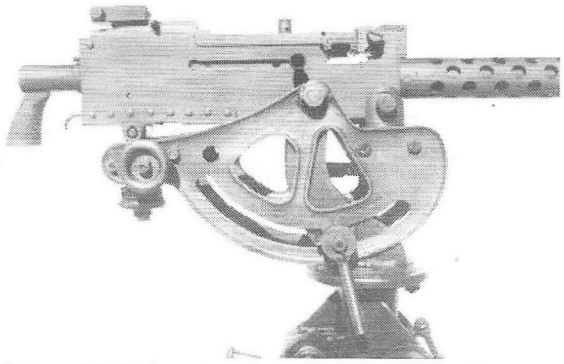
The Browning design didn't use a muzzle booster, and the Type Triple-Tens didn't have

[57] Reference 13, Vol. I, p. 177.

one either. The muzzle end was sealed by a gland. It needed packing material to seal the front and back with grease. It helped the barrel to recoil and also served as a seal to prevent water from leaking. The air cooled model needs a booster due to the much heavier barrel.

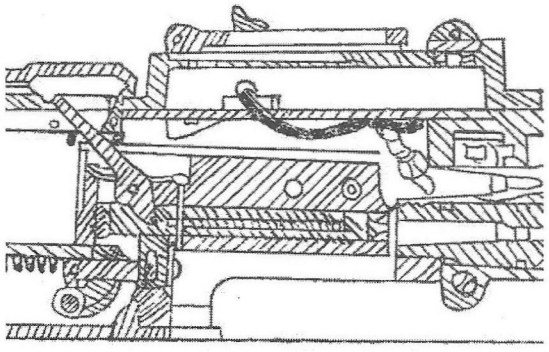
The original design secured the rear via the bottom plate. The bottom plate soon experienced fatigue and caused the receiver to split. The modified 1917A1 in 1939 changed the bottom plate assembly to rivets on both sides of the receiver wall. The Type Triple-Tens appears to have a separate bottom plate. The change must have been due to the actual experience in extended deployment. The Type Triple-Tens were probably used in real action more than the 1917 at that time. Once it was put to use, people would easily come to the same conclusion.

Picture 394 The Colt commercial tripod mount with a 1919A4. It is also known as the M35 tripod. Note the difference of the cradle with the 1917A1.



Picture 395 The standard 1917A1 tripod. Note the lightning cut and the added traverse knob in the rear.

槍匣剖面圖



Picture 396 Section view of the Type Triple-Tens receiver area. The dark hose like area was supposed to be an oil tube. At least one source states that the cartridges were lubed before entering the chamber. Reference 36.

The Type Triple-Tens were copied via reverse engineering, so the performance wasn't very stable. According to a test conducted by the Ordnance Office in the 1930s, none of the test guns could fire more than 200 rounds continuously. And this was the result of 10 years of producing the gun! The Browning design on the other hand was one of the most reliable guns in history. In the US Army trials, the Browning gun holds the record of firing 39,500 rounds without any parts breakage or stoppage. The Ordnance Office tried many times to obtain drawings from both the US

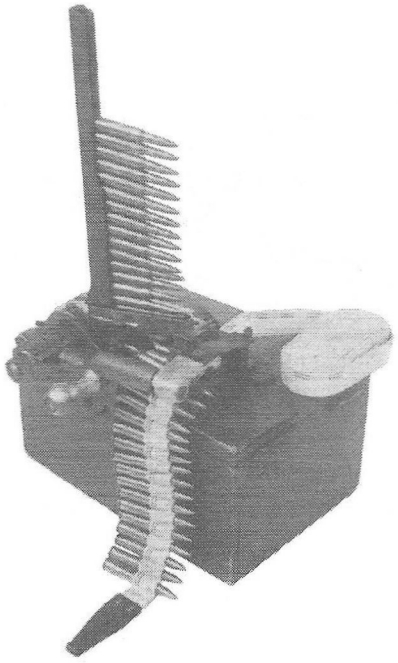
and Belgium without any success. At one point, it was decided to halt the production and focus solely on the Maxim type heavy machine gun.

Picture 397 Nationalist troops in Shanghai during the 813 Shanghai Incident. The Type Triple-Tens tripod is put at its lowest setting to reduce exposure and, by the look of the adjustment handle, it's a Chinese produced gun. It also has the ammunition box bracket on the left. Note the soldier on the right holding a pair of binoculars who has a Nationalist Sun emblem on his helmet.

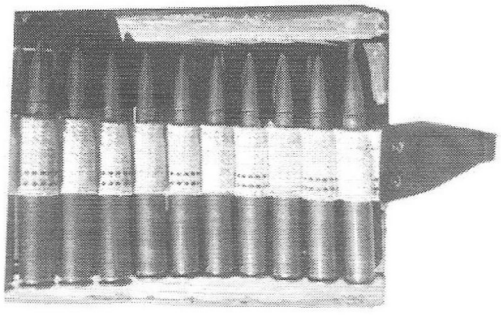
The Type Triple-Tens production in China was fairly small. Major producers such as the Hanyang Arsenal could only produce around 300 guns a year, the Shanghai Arsenal could produce around 500 and the others produced much less. During the war, the Hanyang machine gun factory was transferred to the 11th Arsenal. The 11th Arsenal continued production to the end of the war. However, the volume didn't increase dramatically like that of the Type 24 at the 21st Arsenal. Comparatively, the US produced 50,000 complete guns between 1917 and the Armistice, not counting spare parts. Even with the relative low production rate, the Type Triple-Tens was the primary heavy machine gun used in by Chinese troops during the 1920s.

Picture 398 During the 128 Shanghai Incident, the 19th Route Army was in a defensive position. The Type Triple-Tens is the center piece and note that the soldier on the right is charging his Hanyang rifle with a 5-round en bloc clip.

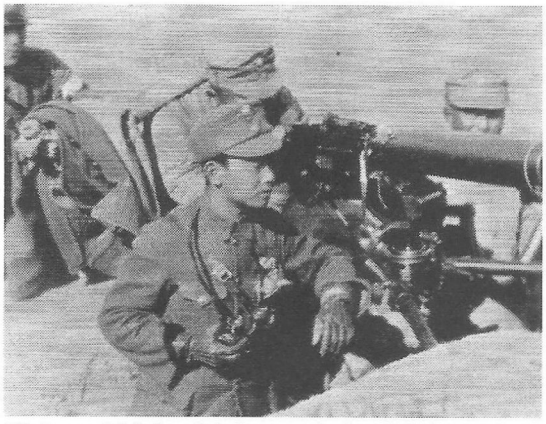
The Type Triple-Tens uses a cloth belt. The Browning belt doesn't have separators to indicate the depth of the inserted cartridges like a Maxim belt. Instead, each pocket has narrow stitches to show where the shoulder of the cartridge should rest. Browning also designed a belt loader for the M1917, which was standardized as the "Cloth Belt Filling Machine, Model of 1918" by the US Army. There is no record that shows that the Chinese ever made a belt loader to go with the Type Triple-Tens. The soldiers probably had to load the belt by hand. It is pretty painful to load a cloth belt that way.



Picture 399 The Cloth Belt Filling Machine, Model of 1918, US. It is sitting on top of the wooden carry box. Usually it was secured by clamps or screws to a workbench. The crank handle is on the left.



Picture 400 The 250-round cloth belt in a wooden ammunition box.

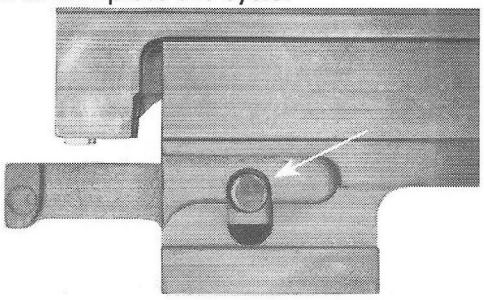


Picture 401 A widely used photo of a machine gun unit during the 128 Shanghai Incident. The gun is generally thought to be a Browning 1917. Note that the tripod appears to be the Shanghai Arsenal style by the look of the cradle knob. Courtesy of Leeland Ness.

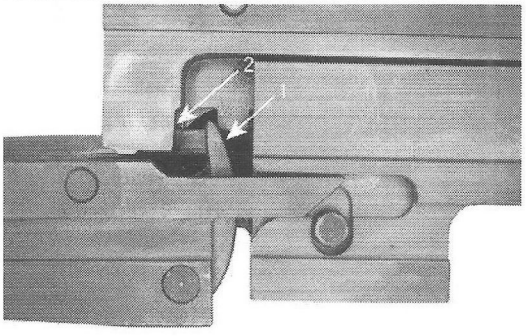
Picture 402 After partially blowing up and increasing the brightness of the previous picture, the unique Chinese factory identification plate can be seen. This positively identifies the gun as a Chinese Type Triple-Tens heavy machine gun which was and probably made by the Shanghai Arsenal.

Browning designed a gas operated machine gun which was adopted by the US Army as the Colt 1895, It was also known as the "Potato Digger." Browning was not happy with the design and he finally came to the same conclusion as Maxim did that the recoil operated machine gun was the simplest and most reliable design. During operation, the Browning machine gun barrel and barrel extension recoil about 16mm after a shot is fired. During that time, the bolt is unlocked

and via an accelerator the bolt continues its travel to complete the cycle.

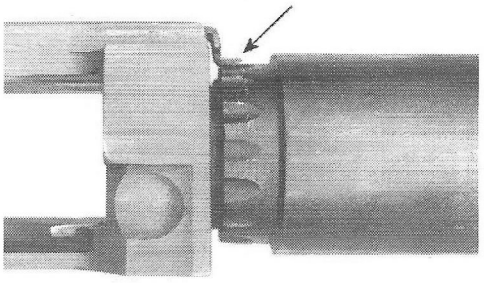


Picture 403 Browning machine gun operating stage one: The arrow points to the bolt locking lug. It moves up and down to lock and unlock the bolt. In the up position, it locks into a recess underneath the bolt.



Picture 404 Browning machine gun operating stage two: When the barrel and barrel extension recoil, the arms from the lockframe push the locking lug down and unlock the bolt. The accelerator (arrow one) hits the bolt(arrow two) and provides more energy to the bolt to complete the rest of the cycle.

One of the biggest operating issues of the Browning machine gun was the head spacing. At the time there simply wasn't the technology to produce the tolerances to have a fixed head space so it was left as adjustable. Headspace had to be adjusted correctly by the gunner for the gun to operate properly. Different ammunition, prolonged usage and changing the barrel could all result in head space changes. Incorrect head space could result in anything from sluggish operation to a blown-up receiver.



Picture 405 Browning machine gun head space adjustment securing snap. After the head space is correctly adjusted, the snap keeps the barrel in place.

Another issue affecting the Browning machine gun operation is its "timing". The Browning machine gun doesn't fire when everything is stationary, so the firing pin release timing is critical in automatic fire. Incorrect timing is the primary reason that the Browning machine gun won't fire automatically. It could be adjusted by the trigger bar. The US Army issued a "Timing & Head Space Gauge" tool for machine gunners to make adjustments in the field. Without this tool, adjustment would have to rely on the machine gunner's personal experience.

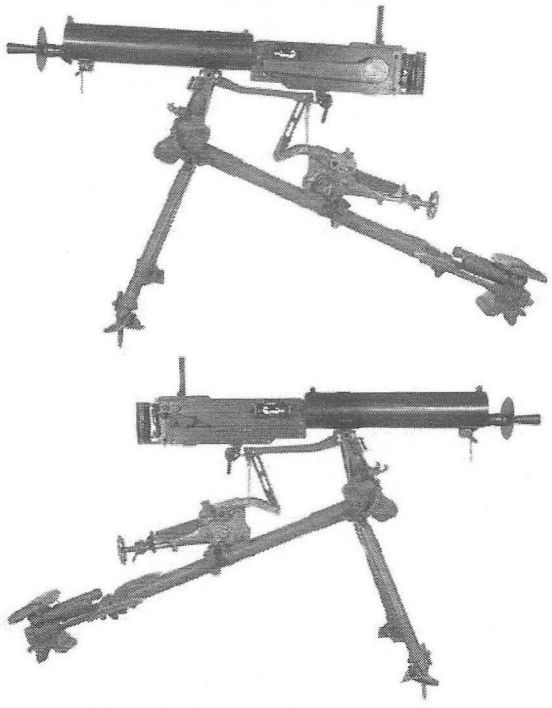
Starting in 1943, the US planned to supply enough equipment for 30 Infantry Divisions to China under the Lend-Lease Act. There to be included were 2,448 Browning heavy machine guns. The actual number delivered was 2,160 1917A1. These guns were identical to the Type Triple-Tens so there wasn't any training issue involved but the .30-06 ammunition was a problem. The Browning gun actually could be converted to 7.92 caliber as well as others. The solution is actually really simple. The only things that needed to be changed were the barrel (which the Type Triple-Tens used) and a new cartridge spacer in the feed way due to the 6mm difference in length between the 7.92x57mm and 7.62x63mm cartridges. However, there is no record of this conversion being done at the time.

China also obtained some fixed Browning guns. After the Nationalist Government was established in Nanking, one of the main goals of the government was to establish an Air Force. Among the planes purchased were the US Curtiss Hawk and Boeing 281, both of which mounted the Colt Browning machine gun in .30-06. Looking back, they could have been in 7.92 as long as the Chinese authority had asked. This would have eliminated yet another supply issue and save some money by not importing .30-06 cartridges from the US.

The authorities might not even have been aware of this detail. As soon as the war broke out, the Chinese Air Force put up a short but brilliant fight against the Japanese aviation forces. On the second day of the Shanghai war, August 14, 1937, the Chinese fighters shot down six Japanese airplanes without any loss of their own. It is still celebrated today in Taiwan as "Air Force Day". However, through the attrition of war, the Chinese soon lost all their planes accumulated prior to the war. The ammunition problem probably was not an issue after all.

The Type Triple-Tens served the Chinese Army from the 1920s on. The number produced in the 20 odd years must have exceeded 10,000 guns at minimum. It was still widely used during the war against Japan.

II. Fujian, Gongxian, Shandong (魯), Hunan, Taku, Jinling Produced Maxim Water Cooled Heavy Machine Gun & Type 24 Maxim Water Cooled Maxim Heavy Machine Gun

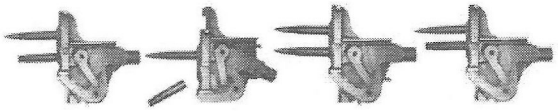


Type 24 Maxim Heavy Machine Gun Specifications

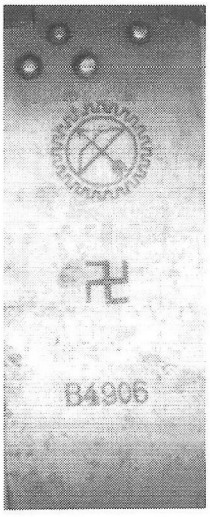
Operation Method： Recoil operated
O/A Length： 1,197mm
Barrel Length：721.2mm
Caliber：7.92x57mm
Weight：20kg
Muzzle Velocity：870(spitzer)/770(heavy spitzer) m/s
Feed：250-round cloth belt
Rate of Fire: 480-600 r/m

The American inventor Hiram S. Maxim started working on automatic weapons in 1882. He experimented with all three operating principles – recoil, gas and blow-back. He concluded that the recoil operated gun would be the simplest and most reliable. His first sample gun won a gold medal in the Inventions Exhibition in April, 1885. In March 1887, he sold the first two

guns to the British military. From this point on, automatic weapons would change military tactics forever.



Picture 406 The Maxim machine gun lock operation cycle. From left: 1. Shot is fired. 2. Eject the empty cartridge case and feed a new round. 3. Locking complete and attach on to another round in the belt. 4. Fire the next round. Note that there are lateral movements not shown.



Picture 407 A feed cover of the Type 24 made by the 21st Arsenal. Note (from top to bottom) the Ordnance Office crest, the 21st Arsenal crest and the serial number. Robert W. Faris collection.

The Chinese were introduced to the Maxim machine gun very early on. The Jinling Arsenal produced a copy as early as 1889 but it was not put into production. In March 1914, Jinling again produced a copy of the German Maxim machine gun and named it Huaning (華寧). Production stopped in 1921after 300 were produced, probably in favor of the Type Triple-Tens. German records also show that DWM sold 16 Model 1909s to China in the first half of 1913.

Many other arsenals produced the Maxim but the most important one was the Type 24 from the Jinling Arsenal, it also produced the most quantity over time.

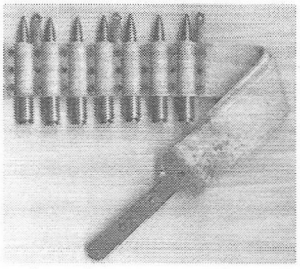
The Annual Report of the Ordnance Office Technical Branch in 1934 stated: "(3) Heavy Machine Gun: The complete drawings were supplied by the German Ordnance Authority. They were turned over to the Jinling Arsenal to use as a standard to modify the current production model. It is estimated that the new model can begin production in October." In the foreword of the Type 24 instruction manual it also stated "This arsenal has been producing Maxim pattern guns for over 20 years from the time when the Ordnance Office forwarded the German drawings. Based on the drawings, modifications and additions were made ... when all was done, the gun was renamed the 'Type 24 79 Maxim Heavy Machine Gun.'.[58] The new model started at serial number 2551. There were 18,694 guns produced by the 21st Arsenal during the war. There are several points about the Type 24thatneed to be clarified:

- The Type 24 was not modeled after the German MG 08. It is modeled after the DWM commercial Model 1909.
- The Type 24 isn't solely based on German drawings. The drawings were used to tighten up the tolerances to modify the existing production gun and added features like a blank firing device, anti-aircraft mount, etc.
- There were many improvements made by the Jinling and 21st Arsenals such as the trigger, anti-aircraft drum, etc., which are not found on an MG 08 or DWM 1909.

The basic design of the Type 24 was the DWM 1909 and the lock was an easy detachable type with head space adjustment. The tripod was the improved lighter version, similar to

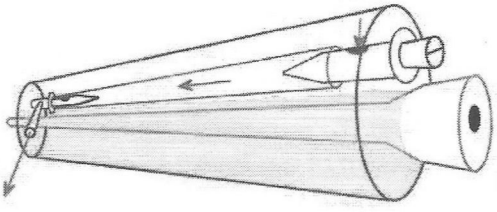
[58] Type 24 Maxim Machine Gun Instruction Manual, the 21st Arsenal, 6th edition, May, 1948.

the German 1916 model. One out of every six guns that came out of the 21st Arsenal were equipped with anti-aircraft accessories. These accessories included an anti-aircraft extension, anti-aircraft sight, shoulder stock and anti-aircraft belt drum.

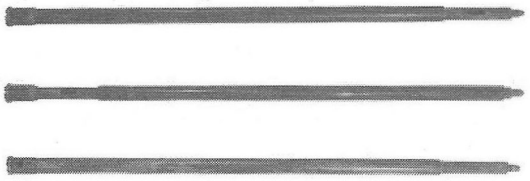


Picture 408 The Chinese produced Maxim belt with the "Proofed and Accepted" seal. Courtesy of Jean-Francois Legendre.

Picture 409 Photo from the Suiyuan Exercises (綏遠演習) right before the war in 1937. This gun was adopted as an anti-aircraft gun with full anti-aircraft extension, drum and shoulder stock. Source A.

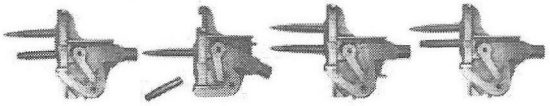


Picture 410 The Maxim water jacket illustrated. The two steam intake plugs on top at each end had openings to allow the steam to enter. The arrow denotes the direction of the steam. There is a sliding tube between the two plugs which moves in accordance with the gun's elevation to prevent water from entering the tube and only the intake plug above the water is exposed. The Type Triple-Tens has a similar design, but instead of the plugs it uses a long tube with openings on both ends. It also uses a sliding tube to prevent water from entering the steam tube.

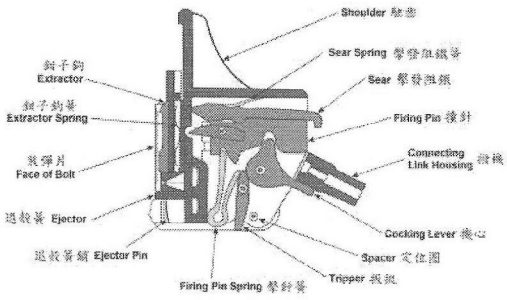


Picture 411 The steam pipe and sliding tube of the Type 24. There are intake holes on both the left and the right.

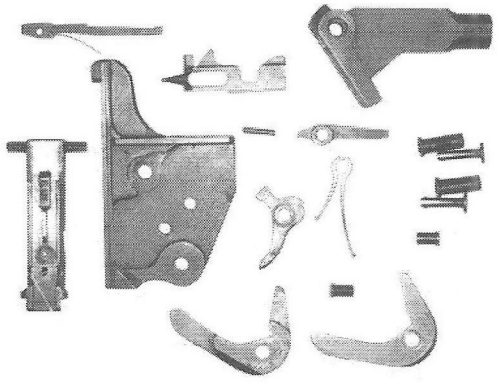
The Maxim machine gun does not have a traditional bolt; it uses what is known as a lock instead which performs the firing, feeding and ejection operations. The lock connects to a toggle like mechanism. The principle it uses is like a human elbow. It has the strongest resistance when it is straight and in the Maxim gun the toggle is straight when firing. It bends when the barrel recoils and allows the lock to withdraw the empty cartridge case. This type of locking mechanism is similar to a rear locking mechanism and demands stronger cartridge shell strength.



Picture 412 Operation of the Lock; starting from the left, 1. Round fired, 2. Cartridge case extracted, ejected and new round fed into the chamber, 3. Locking completed and a new round extracted into the feed way, 4. New round fired.

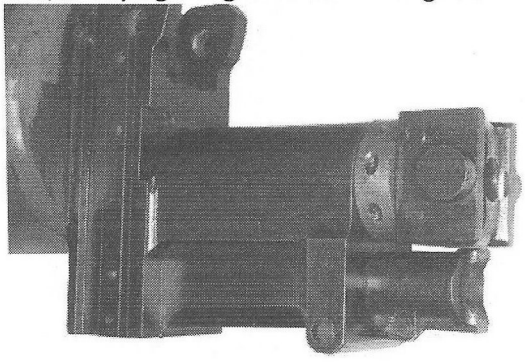


Picture 413 The Type 24's lock and its components.



Picture 414 The Type 24 lock disassembled.

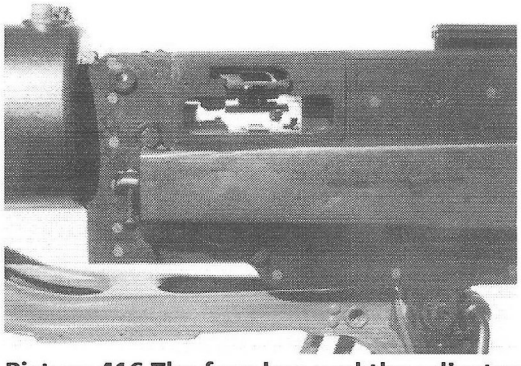
The Maxim gun uses recoil energy to operate the gun. The barrel and slides recoil together, rotate the handle clockwise, and then stop. The lock opens the chamber to eject the empty cartridge case and then the internal is moved back by the main spring in the fuse box, readying the gun to be fired again.



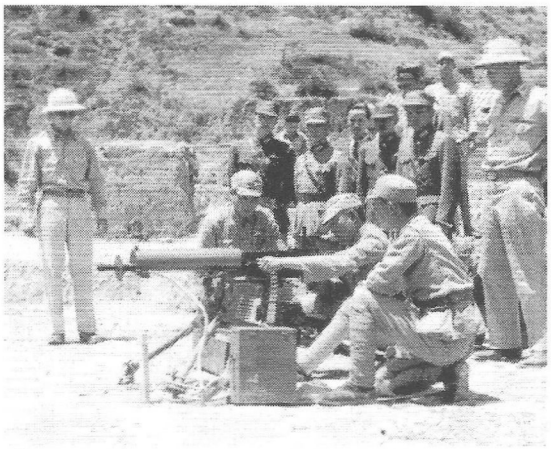
Picture 415 Internal view of the Type 24 chamber and ejection port. Note the extractor.

Type 24 production of the 21st Arsenal			
1927	170	1937	626
1928	228	1938	1,060
1929	324	1939	1,971
1930	348	1940	2,468
1931	372	1941	1,860
1932	280	1942	1,980
1933	336	1943	2,680
1934	280	1944	2,986
1935	330	1945	3,063
1936	610		

The Maxim machine gun has an adjustable main spring located at the side in a box called the "fuse box." It is similar in concept to the gas adjustment on a gas operated gun. Different kinds of cartridges, a different environment or reassembly after cleaning all call for readjustment. It is critical to have the spring at the appropriate level to guarantee the proper functioning of the gun. It became a critical task for the gunner to make sure that it was at the right setting. If it is too strong it will affect the functioning of the gun, too weak would result in unnecessary wear and tear.



Picture 416 The fuse box and the adjustment handle on the left. There are markings on the box to denote the strength of the spring but it is not a precise measurement.



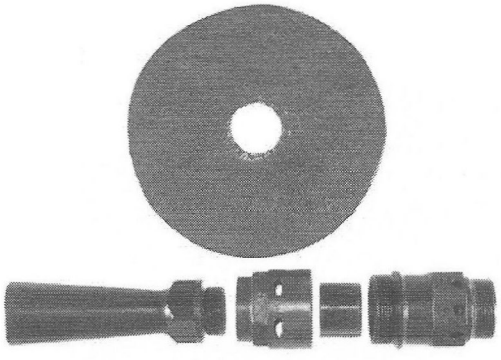
Picture 417 Type 24 training at the Kunming Infantry school. Even though there was an ammunition box attachment available on the gun, it was rarely used. The ammunition box usually was just left on the ground. The belt must be fed smoothly into the gun. If the belt hangs over the right side of the gun, it would cause too much drag and the gun would fail to feed. Note the American instructors wearing pith helmets but there is one instructor in the back with a cap. There were also four Chinese officers standing behind the gun with a Chinese civilian in a suit, who might have been a translator.

Another Maxim invention was to use water to cool the barrel. It takes advantage of the fact that under regular atmosphere pressure water can only go as high as 100 degree Celsius. Any excessive energy would turn water into steam and take the heat away. As long as the barrel jacket keeps the water level, the barrel could only be as hot as 100 degrees Celsius (212 degrees Fahrenheit) which is pretty low for steel. Because some water would leak from the front and the rear of the barrel, the escaping steam would reduce the available water in the jacket, the gunner had to refill the water jacket as necessary - usually after each belt is expended. No steam would come out of a cold gun until after two to three belts were fired in rapid succession.

The cold water chest often seen with a water cooled machine gun was called a "condenser."Its purpose was to cool the steam so it didn't turn into a fog to block the gunner's vision or signal the gun's position to the enemy as well as to turn the steam into water again for refilling. On average, every 1,000 rounds fired required about 1.7 liters of water. The barrel jacket could hold 4 liters, and a two gallon container could hold about 9.1 liters. Together they could sustain about 8,000 rounds of firing. In practice, more might be need due to the steam leaking/water recycle process.

It was critical to pack the Type 24's barrel on both ends during operation so the barrel was completely submerged in water. However, the barrel wouldn't recoil if the packing was too tight, and the water would pour out if it was too loose. The packing thread can today be replaced with plumbing tape with a lot of grease around it.

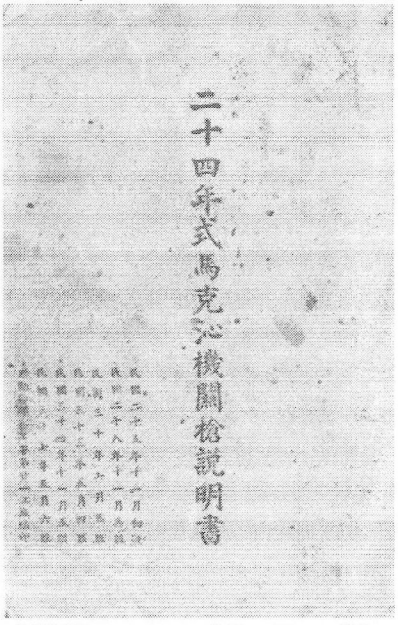
There was a round iron plate in front of the Type 24 booster. The plate was there to block the muzzle flash coming out of the booster so the flash wouldn't be visible to the enemy. The flash hider on the other hand is to reduce the muzzle flash so it wouldn't blind the gunner. The flash hider obviously also helped to prevent the enemy from spotting the position.



Picture 418 Type 24 booster disassembled. The round plate went in-between the flash hider and the main booster body. Second from the right is the booster accelerator.

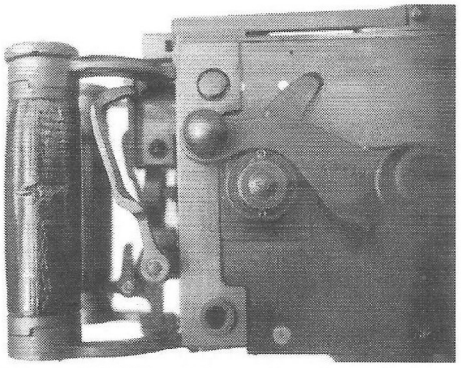
The Type 24 machine gun utilized cloth belts. Each belt could hold 250 rounds and was

stored in a wooden box similar to the ammunition box used by the US Army in WWI. There were leather belts in the early days but these were all replaced with the fabric cloth belts during the war. While all other nations were switching to metal belts, China didn't adopt the metal belt during the war. The belt loader was listed in the manual as standard issue with each gun but no one has yet seen a real one or a picture of one.



Picture 419 The cover of the Type 24 instruction manual, first published in November, 1936. Courtesy of Jean-Francois Lengendre.

The Type 24 trigger was modified based on a later German improvement to a double levelers type so it could be operated with one hand. It is uniquely different from all other Maxim triggers. The typical Maxim trigger needs to have one hand to push the safety away and the other hand to pull the trigger. The Type 24 trigger was therefore called appropriately the "Single Hand Trigger."



Picture 420 The trigger leveler of a Type 24. A pull on the leveler would fire the gun.

The Maxim machine gun didn't have a charger handle; instead it used a crank. To operate the gun, the crank was pushed forward twice. The only exception was the Vickers type which reversed the lock to reduce the height of the receiver and hence also reverse the crank orientation. This was very different from other later firearms using a charger handle with a push/pull type of movement.

The Type 24 machine gun appeared to be very simple, but it had a lot of small parts, especially in the lock. Every little part had to work for the gun to operate properly. Each gun was issued with two locks with the same serial number but marked A and B. The gunner could switch the locks in a few seconds if there was any malfunction and continue to operate the gun. The swapped out lock could be looked at after the battle.

Picture 421 An X-Force machine gunner poses for a photo opportunity. There is no

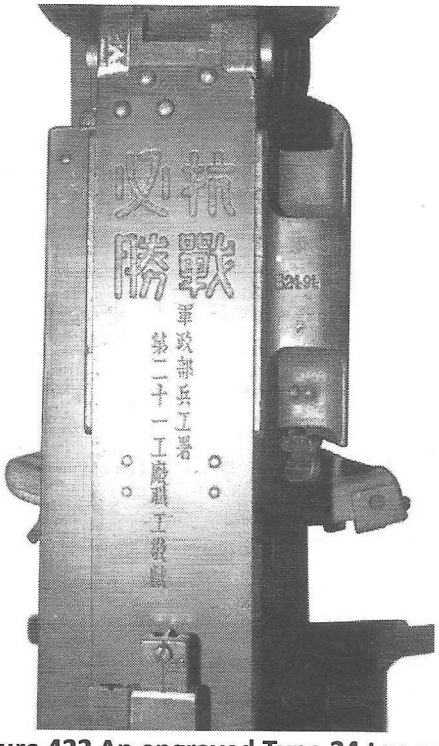
belt loaded, water hose attached or presence of a condenser. Source E.

Although the Type 24's tripod was large and heavy, it still couldn't withstand the accumulated recoil from automatic fire. It needed sand bags and well placed contact points with the ground to ensure its stability. The heavy machine gun is not like other machine guns which could change direction or position easily. To ensure the effectiveness of the beaten zone according to the pre-combat setup, it must remain securely in the same spot.

The Type 24 tripod had built in slots for an armor shield but there is no record that China ever produced such a shield. Under the connecting bar, there is a box for the spare lock. Tool pouch storage is under the sear. The rear leg could store a spare barrel. During WWII, infantry fire power increased dramatically. It resulted in all heavy machine gun designs having the gunner firing the gun in the prone position. For that reason, it changed the tripod design from the two-front, one-rear leg to one-front and two-rear legs so the gunner could lie prone between the two rear legs. The Type 24 can be set flat on the ground but the gunner would have to lie prone on the top of the rear leg, which would be very uncomfortable to say the least.

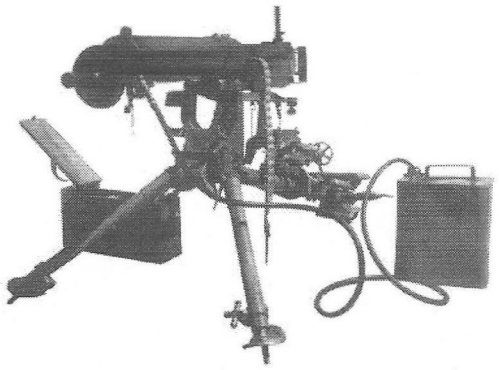
In February 1942, the gun factory chief Shao Jun (邵焌) of the 21st Arsenal led an effort to build standardized parts in the locks. Starting November 1942, each lock would have a serial number on the body only but not on any other internal parts. This stated that all internal parts were interchangeable.

The Type 24 was one of the latest adopted Maxims in history. It incorporated a lot of experience from various models and development. The effort all ordnance people put into its production and modification resulted in one of the most reliable and feature rich Maxim machine guns in the world.



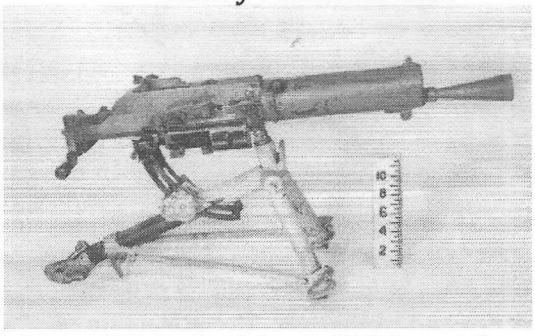
Picture 422 An engraved Type 24 top cover. On the right: "Final victory will be ours;" on the left "presented by all the employees of the 21st Arsenal."

Picture 423 This is said to be the gun that the Communist guerrillas in Shandong "drafted" from the basement of ex-warlord Wu Peifu's old residence. Judging from the roller sight and full brass water jacket, it would appear to be a very early model. It has 2 characters - Shu Wu (樹武) (establish forces) engraved on the top cover. It might be one of the earlier Chinese copies. Beijing Military Museum.



Picture 424 A typical Type 24 setup during the war with cloth belt, British style oil can condenser and American WWI style ammunition box.

III. Sichuan, Guangdong Produced Schwartzlose Heavy Machine Gun



Picture 425 An Austrian built Schwartzlose heavy machine gun. Source B.

Schwartzlose Heavy Machine Gun Specifications
Operation Method：Direct blow-back
O/A Length： 1,067mm
Barrel Length：527mm
Caliber：7.92x57mm
Weight：19.96kg
Muzzle Velocity：618.7m/s
Feed：250-round cloth belt
Rate of Fire: 600 r/m

The Schwartzlose machine gun was designed by Andreas W. Schwarzlose of Germany. Steyr put it into series production in 1905. It was widely used in WWI by Czechoslovakia, Holland, Sweden and the Austro-Hungarian Empire. It used a blow-back system without a positive locking mechanism. The barrel was short to ensure that the bullets exited the barrel before the bolt retracted. It used a very strong main spring, heavy bolt and levers to retard the blow back action. The cartridges had to be lubricated due to the fact that the bolt retracts while the pressure is still fairly high in the chamber.

The Sichuan Arsenal started Schwartzlose heavy machine gun production in 1918. The production rate was very small – about one to two guns per month. About the same time, Guangdong Arsenal produced some small quantity as well. It's worth mentioning that Guangdong also produced this gun in 6.8mm caliber – it was the only 6.8mm machine gun known to exist.

Section 3. Imported Heavy Machine Guns

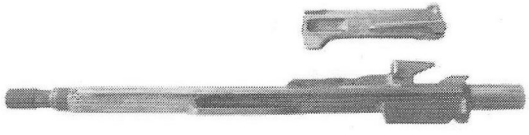
I. Czech Produced ZB-37 Heavy Machine Gun

ZB-37 Heavy Machine Gun Specifications
Operation Method： Gas operated
O/A Length： 1,095mm

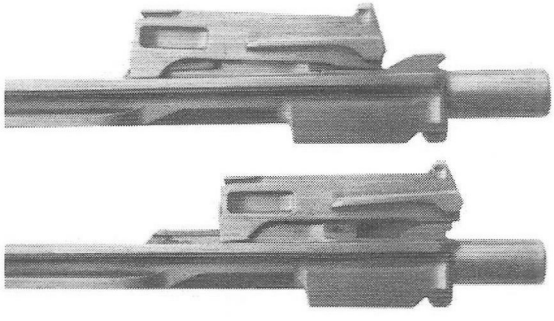
Barrel Length：682mm
Caliber：7.92x57mm
Weight：18.66kg
Muzzle Velocity：850(spitzer)/750(heavy spitzer) m/s
Feed：100/250-round metal link
Rate of Fire: 500-700 r/m

The ZB-37 came from Brno, the same factory that produced the ZB-26. The Chinese government ordered 1,000 ZB-37s in 1937.[59] By the time the occupying Germans put a stop to the shipment, 850 had already been shipped. They arrived in Hong Kong and Rangoon, Burma, between 1938 and 1939. It was a fairly advanced heavy machine gun at the time. It had a quick change barrel, was air-cooled and utilized a metal link belt.

The ZB-37 was an amazing piece of weaponry; it used the best steel available and had very fine workmanship. The gun looked as if it was carved out of a large block of steel.

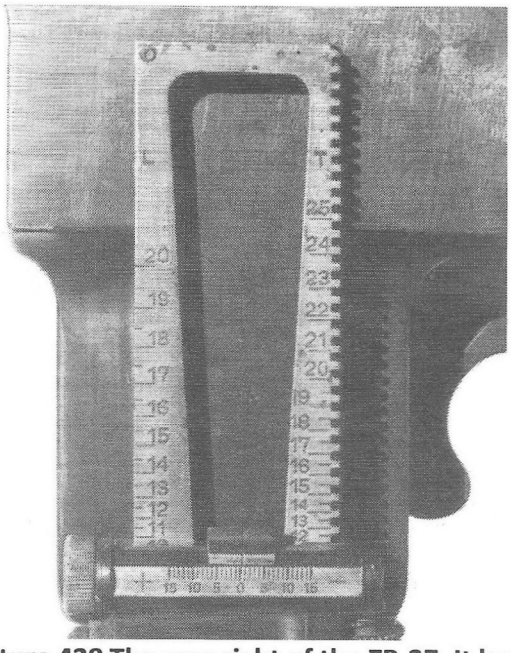


Picture 426 The operating rod and bolt of the ZB-37. They are very similar to those of the Bren gun.

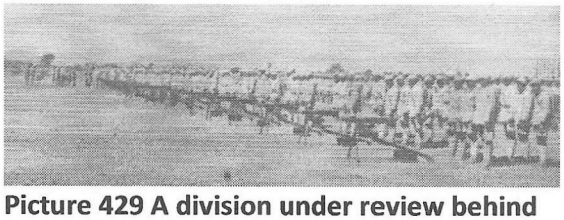


Picture 427 ZB-37 bolt operation. Top: the bolt is unlocked in a rear ward movement. Below: the bolt is pushed forward, the rear end raised to lock against the receiver and fire the cartridge.

[59] The history of the Brno factory "Zbrane Pro Cely Svet", Appendix



Picture 428 The rear sight of the ZB-37. It has two calibrations: L(Lehky) for spitzer bullets and T(Tezky) for heavy spitzer bullets.

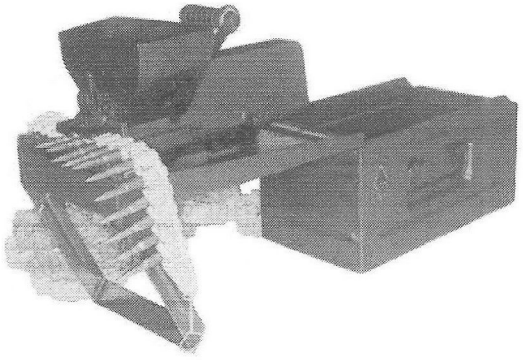


Picture 429 A division under review behind enemy lines in eastern Zhejiang province near the end of the war. There is a line of ZB-37s in front which all have the AA/Ground dual role tripods.

The ZB-37 was also equipped with a rate adjustment toggle. It could be fired either at 450/550 rounds per minute or at 700 rounds per minute. This was always something fantasized by the so-called "military experts." In the real world, soldiers either do not open fire or open fire at maximum rate. There are not many people who have the discipline to adjust the rate of fire during combat while the enemy is approaching based on some preset conditions.

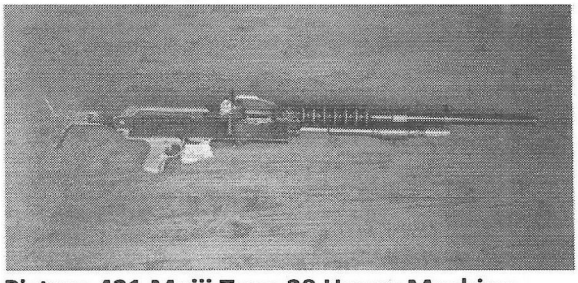
The ZB-37 doesn't have a charging handle. The operating handle underneath the receiver also doubles as a charging handle. When the handle is pushed forward, the firing unit

would hook onto the underside of the bolt; when the handle is pulled back, the firing unit would pull the bolt back and engage the sear ready to fire. The sear can't be released unless the handles are pulled back into proper position.

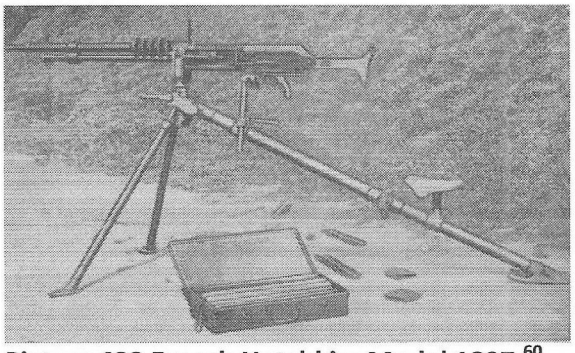


Picture 430 A ZB-37 belt loader, which can load two rounds with one crank.

II. Japanese Meiji Type 38 Air-cooled Heavy Machine Gun



Picture 431 Meiji Type 38 Heavy Machine Gun. Source A.



Picture 432 French Hotchkiss Model 1897.[60]

Meiji Type 38 Heavy Machine Gun Specifications

Operation Method： Gas operated
O/A Length：1,443mm
Barrel Length：726mm
Caliber：6.5x50mmSR
Weight：28kg
Muzzle Velocity：740m/s
Feed：30-round feed strip
Rate of Fire: 450 r/m

Picture 433 Just before the Marco Polo Bridge incident, the 29th Route Army paraded in Beijing. The soldiers here are shown with Type 38 heavy machine guns either made by Japan(unlikely due to the time period), or by Shenxi Arsenal or some other Chinese arsenal. Note the seven heat-dispersing rings on the barrel. International News photo.

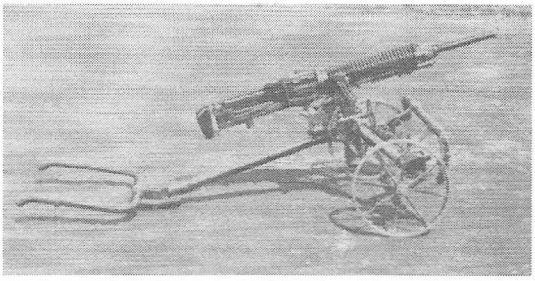
The Type 38 heavy machine gun was copied from the French Hotchkiss 1900 built was in 6.5x50mmSR caliber. It was the first in a series of Hotchkiss based heavy machine guns Japan adopted. It was not a very good design and was soon replaced by the Taisho Type 3.

The Eastern three Provinces, Guangdong and Shenxi Arsenals all produced some guns based on this model. In 1917, the Beiyang Army Department purchased 174 Type 38[61] from Taihei., Prior to 1917,a total of 681 had been purchased. Domestic production volume wasn't very large; the Eastern three Provinces Arsenal probably produced 1,000 guns in total.

[60] Reference 13, Vol. I, p. 192.

[61] Reference 2, Vol II, p. 486-489

III. Japanese Taisho Type 3 Air-cooled Heavy Machine Gun

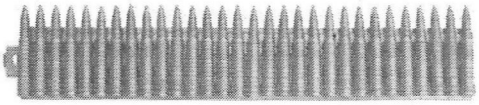


Picture 434 Japanese Taisho Type 3 heavy machine gun. The gun in the picture was mounted on a special wheel mount. From Japanese Ground and Air Forces, War Dept., US.

Type 3 Heavy Machine Gun Specifications
Operation Method： Gas operated
O/A Length：1,204mm
Barrel Length：726mm
Caliber：6.5x50mmSR
Weight：26.6kg
Muzzle Velocity：755m/s
Feed：30-round feed strip
Rate of Fire: 500 r/m

This gun was modified by the Japanese gun inventor Kijiro Nambu based on the Type 38. The Eastern three Provinces Arsenal also produced a copy of this gun called the Type 13 heavy machine gun. , 100 of these had been produced when the 918 Incident occurred.

This is still a Hotchkiss action designed gun. The general guideline for this gun is that the cartridges need to be oiled. American veterans of the Pacific called this gun the "Woodpecker" due to its unique slow rate of fire. They also noted that the rate of fire didn't seem to be constant – it started out slow and gradually picked up speed.

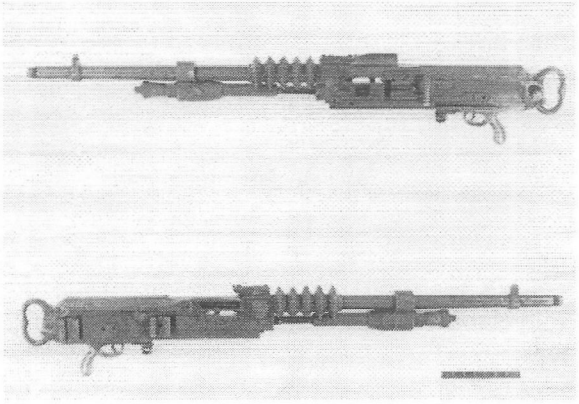


Picture 435 Japanese machine gun feed strip for the Type 92 in 7.7mm. All Japanese heavy machine guns used similar feed strips.

Picture 436 A machine gun demonstration in Nanning (南寧) Military Academy with a Type 3. Lian You #115.

Picture 437 Japanese soldiers operating a Type 3 during the 128 Incident. This picture is from a personal album but the photo was most likely mass produced and purchased by the album owner.

IV. French Hotchkiss Mle. 14 Air-cooled Heavy Machine Gun



Picture 438 French Hotchkiss 1914 heavy machine gun. Source B.

Hotchkiss Mle 14 Heavy Machine Gun Specifications
Operation Method： Gas operated
O/A Length：1,410mm
Barrel Length：740mm
Caliber：7.92x57mm
Weight：24kg
Muzzle Velocity：874m/s
Feed：30-round feed strip or 250-round belt
Rate of Fire: 450 r/m

Benjamin B. Hotchkiss was an American inventor. After the American civil war, there wasn't much interest in new weapons in the US so he moved to France and set up a company to produce arms. He died in 1885.

At the end of the 19th century, the machine gun market was dominated by Maxim guns. Maxim held patents to all the key areas so no one could produce a recoil operated gun without infringing on his patents. In 1892, a Swedish officer Adolf von Odkolek approached Hotchkiss with a gas operated design. Hotchkiss immediately recognized the potential and bought out the design. The first working model was completed in 1897 and was adopted by the French Army. Later it was also adopted by Britain, Japan and other countries. It was most widely used by Japan who started with the Type 38 and made a series of small modifications All Japanese heavy machine guns were of the Hotchkiss design till the end of WWII.

The Chinese "Ordnance Standardization Conference" of 1932 also listed the Hotchkiss heavy machine gun as a standard that the conference recommended but it never became reality.

The Hotchkiss design was very simple, utilizing the gas from the fired cartridge to push the operating rod which took the bolt out of the locking recesses in the receiver. The main spring would return the bolt and strip a round from the feed strip. The most interesting feature was that it used a metal strip in place of a belt or magazine. The French Mle 1914 model had five heat dissipating rings on the barrel.

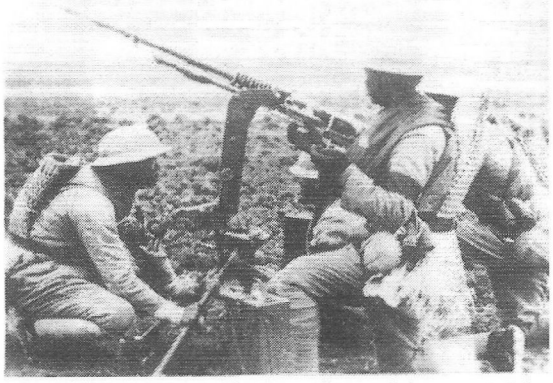
Picture 439 Unidentified Chinese troops stationed in a temple with their Hotchkiss guns lined up in the court yard. In the background is the stage for plays to honor the gods in the temple. Note the flat feed strip ammunition boxes on the ground. Courtesy of Leeland Ness.

The Chinese produced copy most closely followed the Japanese pattern. There were also procurements directly from France. The French Foreign Ministry records show approved exports were:

Eastern Three Provinces：1930: 100 guns

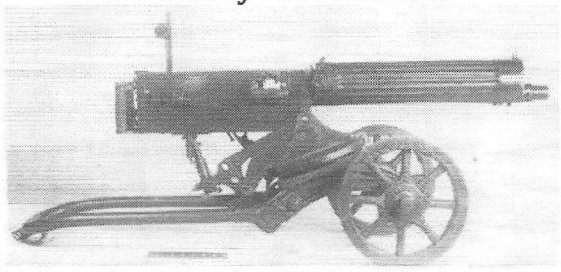
Nationalist Government： Between 1930 and 1936: 400 guns
Yunan：1935: 30 guns, 1937: 102 guns
Guangxi：1935: 120 guns
Guangdong：1935: 110 guns, 1936: 330 guns
The above total 1,192 guns were all in 7.92x57mm caliber.

After the war broke out in 1937, the Nationalist Government placed another order for 1,300 guns and 20 million cartridges. There were subsequent orders placed but France soon fell into German hands and only 300 additional guns were delivered. The total number from the above is 2,792 guns. This is enough to equip 465 machine gun companies of an infantry battalion. It is certainly a very important model that was used by the Chinese Army during the war.



Picture 440 An anti-aircraft position outside of Shanghai during the 813 Shanghai Incident. The gun is mounted on a tripod with the anti-aircraft extension. Also note the straw woven back packs on the soldiers' backs.

V. Russian M1910 Sokolov Maxim Water-cooled Heavy Machine Gun



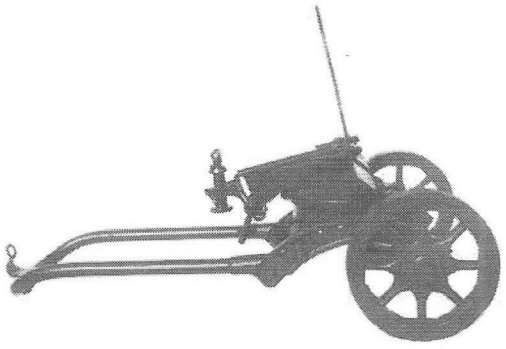
Picture 441 A Russian 1910 Maxim on a wheel mount. The mount pictured doesn't have the shield installed. Source B.

M1910 Heavy Machine Gun Specifications
Operation Method： Short recoil
O/A Length：1,107mm
Barrel Length：720mm
Caliber：7.62x54mmR
Weight：19.8kg
Muzzle Velocity：850m/s
Feed：250-round belt
Rate of Fire: 600 r/m

The primary source of this gun during the war in China was from the Soviet aid programs at the beginning of the war. There were a total of 300 guns imported.

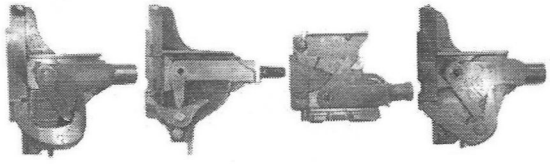
The 1910 was basically the same gun as the Type 24. The parts were not all interchangeable but the operation was identical. Again, it used a different cartridge from the standard Chinese 7.92. The Russians were the largest producers of Maxim guns. By the end of WWII they had produced over 600 thousand guns.

The Russian wheel mount had a provision to install an armor shield to protect the gunners. The wheels were obviously convenient when the gun needed to be transported. Gongxian Arsenal produced a copy of this gun and called it the "Gong Dual Wheel 762 Water-Cooled Machine Gun". Some of these were still in use when the war broke out.



Picture 442 The wheel mount of the Model 1910 with shield installed.

Between 1938 and 1941, the 20th Arsenal produced 850 thousand 7.62x54mmR cartridges. This shows that the Maxim, Maxim-Tokarev, Mosin-Nagant and DP guns might have been fired in anger in China during the war.



Picture 443 The comparison of the locks from four different Maxim type guns. From left to right, Russian 1910, German 08, British Vickers, and Chinese Type 24.

Section 4. Combat Experiences and Comments

Some sources categorized a machine gun that fires rifle cartridges as a "Medium Machine Gun"(MMG) but it was considered a "Heavy Machine Gun"(HMG) in all Chinese records. The special characteristics of the heavy machine gun were:

- Provide continuous fire to support the infantry or suppress enemy fire.
- Be mounted on a tripod with good stability and be able to engage the enemy at 1,000 meters and beyond.
- Can follow the Infantry in action even though it is a crew-served weapon.
- Has some type of mechanism to feed ammunition continuously, either from a belt or strip.

In 1935, the Maxim machine gun certainly was not the most advanced design in the world. However, it was a design that the Chinese were familiar with and could produce in quantity. Even though plans were drawn up to switch to a more advanced model such as the Madsen, Browning, etc., all of these plans fell through. The Type 24 was the mainstay in China throughout the war.

Machine gunners must be considered as a very advanced skill group at that time. Full automatic weapons needed a lot of knowledge to maintain and operate. All the parts must be working together for a machine gun to function properly. For example, the belt of the Type 24 must not be left hanging on the side for the weight of the loaded belt could cause a stoppage. The assistant gunner was advised to either hold the belt in a horizontal position to feed or even pull on the empty belt to help smooth feeding.

There are also many different reasons for machine gun to malfunction, so the gunners must know how to trouble shoot. The crank stop position of a Maxim machine gun was a good indicator, for the various stop positions indicated various parts that needed to be adjusted. In addition, the cleaning and lubricating of all the parts was a daily chore that the gunners needed to perform to ensure trouble free functioning. This was obviously not within the capability of the average soldiers without proper training.

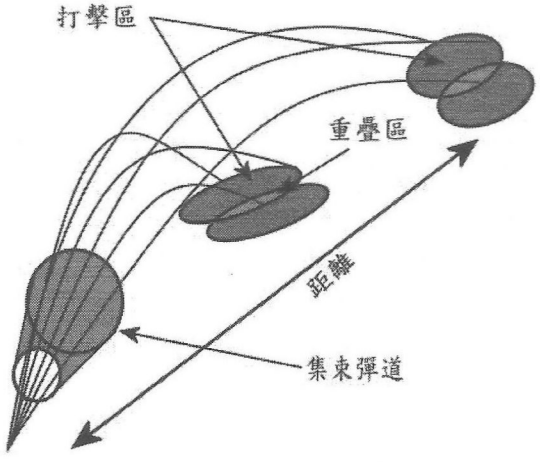
Based on past combat experiences, when the heavy machine gun was placed in the front line, it not only provided sustained fire support but also provided important psychological encouragement to the infantrymen. But the machine gun would become the highest priority target for the enemy as well. In the Shanghai Incident,

Japanese troops often deployed anti-tank guns to destroy Chinese heavy machine gun positions. After each encounter, most of the Chinese heavy machine guns were destroyed.

Another critical issue was water supply. During rapid firing, the water jacket must be refilled after each belt was expended. Without water in the jacket, the gun would soon be rendered useless in two to three belts. The barrel would be seriously damaged from the heat generated by firing. In very cold climates, the water would freeze and additives such as alcohol or glycerin must be added to the water as anti-freeze additives. If these two chemicals were not available, a quarter liter of salt could be added to the water but the water jacket must be thoroughly cleaned afterwards. In an urgent situation, the gunner could also fire a short burst once every so often to keep the water from freezing.. In popular literature or movies of the past, it often showed soldiers urinating on the gun in an attempt to cool it down. This is completely useless for the part that needed to be cooled was the barrel, not the jacket.

The Chinese didn't produce any artillery pieces larger than mortars. All artillery pieces were produced or procured prior to the war; the quantities were obviously very limited. For the infantry units, the heavy machine guns were the only weapons that could engage the enemy beyond 1,000 meters. The battalion commander would have 6-9 heavy machine guns at his disposal but that certainly was not enough to cover a wide frontal area.

During WWI, indirect fire from heavy machine guns was an important tactic. The actual practice involved in setting up a heavy machine gun position included surveying all potential approaches and their elevation relative to the gun position, and calculating the angle and traverse of the gun. Each gun then would form a "Beaten Zone". The principle of the beaten zone was based on the fact that bullets exited the gun in a cone shape so when they land, they form an oval shape on the ground. This oval shaped area was the beaten zone. Ideally, beaten zones should overlap each other. These areas were far from the front line, up to 1,500 meters away and beyond visible range. The tactic called for machine gun fire as well as rifle fire using the "Volley Sight" to eliminate the approaching enemy. During WWII, this role was mostly replaced by mortars and heavy machine guns were sometimes switched to an anti-aircraft role. During the attack of Ji Yuan in April, 1938, a Chinese battalion lost about a third of its men when it came under Japanese indirect fire.[62]



Picture 444 An illustration of the Beaten Zones concept.

In China, troops also relied on the heavy machine gun to provide covering fire inside the 1,000 meter range. However, due to the weight and immobility, it was not a good use of the heavy machine gun. The heavy machine gun in this role was easily discovered and destroyed by the enemy. It was unlike the MG 34/42, which provided a high rate of fire and was still very mobile. It could switch positions easily and not be caught by concentrated enemy fire.

---

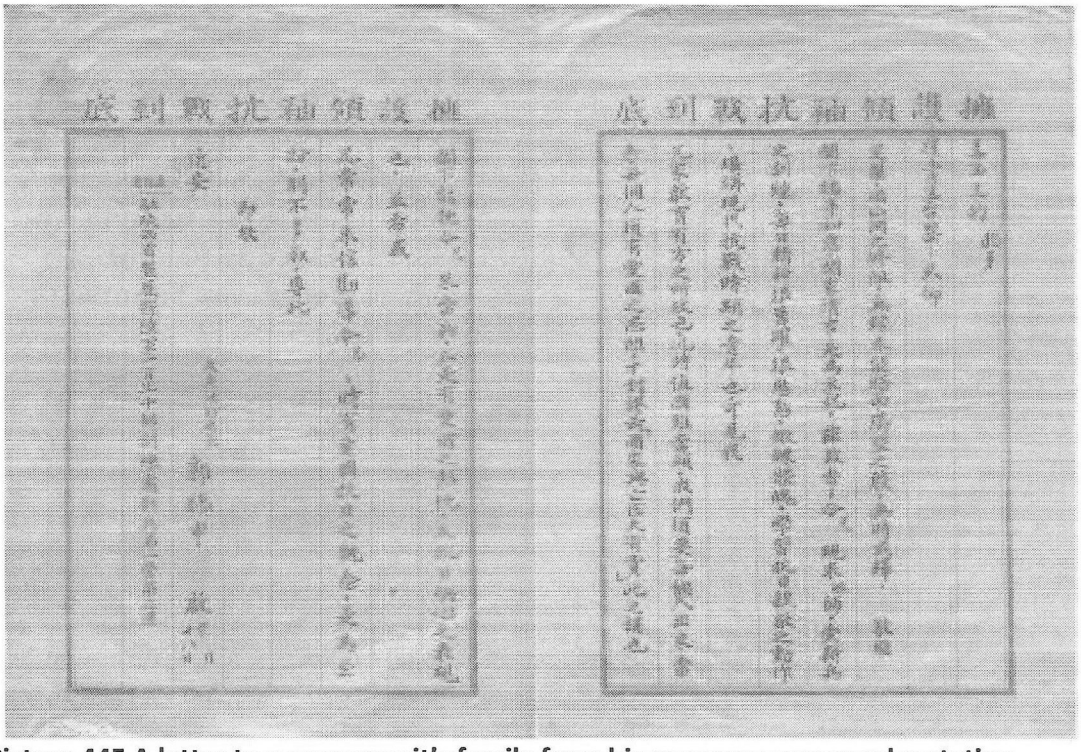
[62] Fighting Japanese Troops in Northern Henan, Li Wending (李文定), Zhong Yuang Campaign (中原抗戰), p. 580.

Heavy machine guns should be used as an area fire weapon and should play a different role from rifles or light machine guns. Heavy machine guns could provide more sustained fire but were not as mobile. It should be set up in a fixed position and the fire cover a predetermined area. Using heavy machine guns as target weapons, following enemy movement, would mean exposing the positions to the enemy and attract fire immediately. The average monthly loss of heavy machine guns in the eight years of war was 119, which would indicate that in the major battles and campaigns, there was a heavy loss of heavy machine guns. On the other hand, the average monthly production rate was 195, which was enough to support the war effort.

In October 1943, Capt. Wm. W. Richardson, Jr. of the Infantry Training Center in Kunming submitted a memo titled: Deficiencies of Chinese Weapons Used at ITC. In the heavy machine gun section he reported:

"Twenty three of these weapons have been used to fire 430,000 rounds. The main difficulties experienced are:
Ejectors break excessively, 179 out of the original 186 having become unserviceable. Attached are three examples of broken ejectors showing the typical point of fracture.
Firing pins show excessive breakage at the point of the striker (See attached two examples.)
The barrels also show considerable pitting.
Outside of these troubles, believed to be largely caused by a shortage of proper alloying materials, these weapons have held up very satisfactorily."

This memo was forwarded to Gen Yu Dawei, the Chief of the Ordnance Office, on November 12. These reports revealed parts issues involved in the Type 24 production at the time.



Picture 445 A letter to a new recruit's family from his company commander stating that the recruit worked hard and would be taken care of. It also asked the family to please write to him often.

Chapter 7. Other Weapons

"As long as we can hold our positions firmly, if everyone fights to the death, and if we drag out the war against Japan for three to five years, the final victory will be ours."

Basic knowledge in the war against the enemy (2), Speech to the second group of Generals leaving for the front line in Lu Shan Training Corp. Chen Cheng, July 13, 1937

Section 1. The Submachine Gun in the Chinese Army

At the time of the war, the submachine gun wasn't part of the standard TO&E. However, many troops inherited some submachine guns from the past, especially the troops from Shanxi. All had quite a few locally produced submachine guns in service.

Other troops who might have had submachine guns were the personal guards for the Division or Army Corp. Commanders or those in the Special Services Platoons/Companies and such. It was not a widely distributed weapon. One of the reasons was that 9mm or 45ACP cartridges weren't produced domestically. The only pistol cartridge produced during the war was the 7.63mm.

The LPA was an exception. All the squad leaders and assistant squad leaders were armed with Thompson UD M42 submachine guns provided by SACO. However, the LPA was a paramilitary unit, not a regular army unit, which mostly operated behind enemy lines.

Picture 446 A period cigarette card. In the picture, there are several officers inspecting the defensive position construction. The soldier on the right seems to be wearing submachine gun magazine pouches and has a submachine gun on his shoulder.

The X-force in India was equipped with large numbers of Thompson guns. Some were issued to the Y-Force as well prior to their departure for the second Burma campaign.

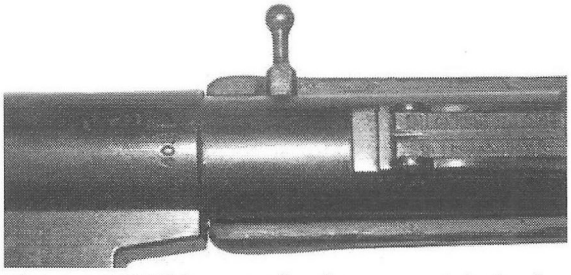
Section 2. Domestically Produced Submachine Guns

I. Gongxian, Taku, Shanghai, Jinling, Guandong, and Hanyang Produced Bergmann Submachine Gun

Picture 447 A Bergmann pattern submachine gun of unknown origin, no markings. Source G.

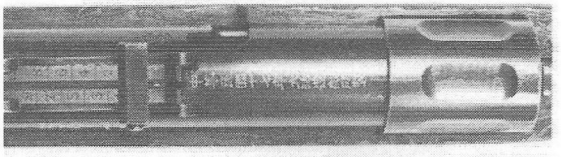
Bergmann Submachine Gun Specifications

Operation Method：Blow-back
O/A Length： 820mm
Barrel Length：200mm
Caliber：7.65x21mm/7.63x25mm
Weight：4.33kg
Muzzle Velocity：390m/s
Feed：20 to 50-round box magazine
Rate of Fire: 500-600 r/m



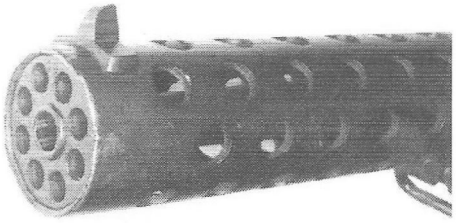
Picture 448 This gun of unknown origin had a slim bolt handle. Source G.

Picture 449 A Taku produced Bergmann pattern submachine gun. Note the magazine well is turned 90 degrees, facing the bottom. Tom Nelson collection.



Picture 450 The receiver marking of the above gun, "Made by the Taku Dockyard in 1928". Tom Nelson collection.

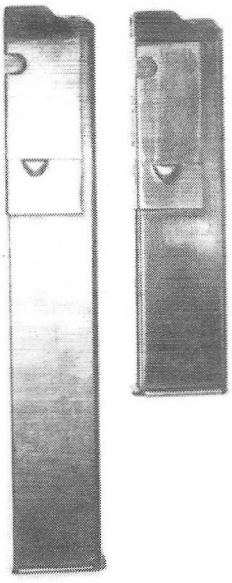
Chinese civilians nicknamed this gun the "Floral Mouth Machine Gun" due to the ventilation holes on the muzzle cap. The. MP 18/I was designed during WWI. At that time, troops were in a stalemate and were stagnated in thousands of miles of trenches. Everyone was trying to find a weapon to break the situation. The primary ideas were automatic rifles and submachine guns. The Germans developed the first practical portable submachine gun and issued them to the troops. It's named a "Maschinenpistole" because it used pistol ammunition.



Picture 451 The ventilation holes on an MP 18/I earned it the nick name "Floral Mouth Machine Gun."

In 1915, the German Rifle Test Commission proposed a list of features for a new weapon. In 1918, the design of Hugo Schmeisser was adopted as the MP 18/I. Even though Schmeisser designed a box magazine, the Commission insisted on changing the magazine to the snail drum magazine used by the P08 Luger. The gun showed up too late to make a difference in WWI. There were only around 3,000 shipped to front line troops judging by the captured guns' serial numbers. However, the capability of the submachine gun had already impressed the soldiers and they called it the"Bullet Squirter" (Kugelspritze)[63].

[63] Blitzkrieg, Frank Iannamico, p 24., Royal Publications Inc.



Picture 452 A comparison of the magazine used by the MP 18/I and the MP 28 (on the left). Note the difference in the wrapping areas; the two are not interchangeable. The STEN magazines are identical to those of the MP 28.

After WWI, Schmeisser continued to work on the MP 18/I. He reverted back to the box magazine design. When he designed the box magazine, he also solved an age-old magazine issue. Most submachine guns do not have a feed ramp so a dual feed design would be problematic. Schmeisser designed the magazine to have the wider body to allow a "staggered column" of cartridges but when it came to the feed area at the top, the magazine narrowed into "single position feed". This is called Schmeisser's Cone.

The new version was designated as the MP 28. The differences between the MP 18/I and MP 28 are:

- The MP 28 is a select fire gun and the MP 18 can only fire automatically.
- The MP 28 changed the magazine well design so the magazine was not interchangeable with that of the MP 18/I.
- The MP 18/I uses a smaller diameter main spring which is wrapped inside the bolt extension while the MP 28 uses a larger diameter spring wrapped around the bolt extension. The spring is visible from the outside through the charger handle slot on the MP 28.
- The MP 18/I used a simple flip-up sight while the MP 28 used a rifle type rear sight, scaled to 1,000 meters!

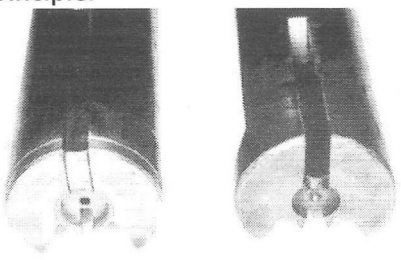
Picture 453 A German MP 18/I. Note the flip-up sight.

The submachine gun was one of the restricted weapons under the Versailles Treaties. Theodor Bergmann Abt Waffenbau, the original manufacturer of the MP 18, licensed the Swiss Industry Company (SIG) to continue the production. SIG came out with the Model 1920, chambered in 7.65x21mm, 7.63x25mm or 9x19mm. The magazines were yet a different design, not interchangeable with either the MP 18 or MP 28. It was dual feed and the capacity was increased to 50 rounds. If a Chinese made Bergmann could be examined then it should be easy to determine if the gun was copied from the German or Swiss model.

Bergmann was the first generation of submachine guns. It was the first to utilize open bolt firing. When the bolt is pulled open, it is engaged by the sear and inserting a magazine does not close the bolt. Only when the trigger is pulled will the bolt fly forward and fire. The reason for the open bolt is to

allow air to enter the chamber while it is not firing. It was the only way at the time to help to cool down the chamber to prevent cook-off of a round in the chamber.

The operating principle is simple blow-back, utilizing the weight of the bolt to retard bolt movement. Later models such as the STEN, MP-34, andMP-38/40 are all based on the same principle.



Picture 454 Comparison(or similarity) between an MP 18 bolt(left) and a STEN bolt. Note the STEN firing pin is directly machined into the bolt face.

Jinling and Shanghai Arsenals started the production of Bergmann pattern submachine guns in 1926. The guns were the select fire models. They produced 1,000 and 5,000 respectively. The Browning pistols produced in both arsenals were in 7.65x21mm and the Bergmanns were probably also in the same caliber. The " Specification of Chinese Army Small Arms in Use"[64], lists domestically produced Bergmanns as 7.65mm caliber but contains no details on who produced them.

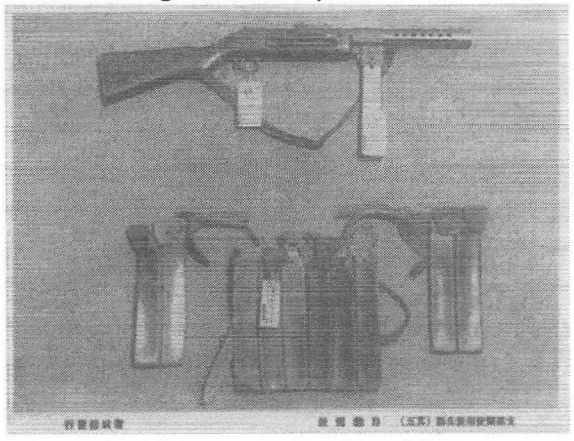
Taku and Hanyang Arsenals both produced a MP 28 in 7.63mm caliber [65], which is a copy of the MP-28. The magazine is the long type with a capacity of around 40 to 50 rounds. Gongxian Arsenal also produced Bergmann submachine guns with a select fire capability.

Japanese data points out that the Shenyang, Shanxi and Beiyang Arsenals all produced some Bergmann pattern submachine guns.

Liu Xian's staff officer Fan Chongshi recalled that Liu ordered 1,200 Bergmann guns from Krupp and 6 million rounds of ammunition. He also ordered 2,400 spare barrels from Belgium. The Nationalist Government ordered 100 Bergmann guns, spare barrels, and 500 magazines from Switzerland.[66]

The MP 18/I can only fire in full automatic mode. During firing, the recoil inevitably adds up like a tidal wave so the muzzle climbs and the shooter quickly loses aim. To avoid wasting ammunition, burst fire is much more effective. With practice, it is possible to manipulate the trigger to achieve a 3-4 rounds burst with the MP 18/I.

The Bergmann type of SMG was probably the most widely deployed and produced submachine gun in China prior to the war.

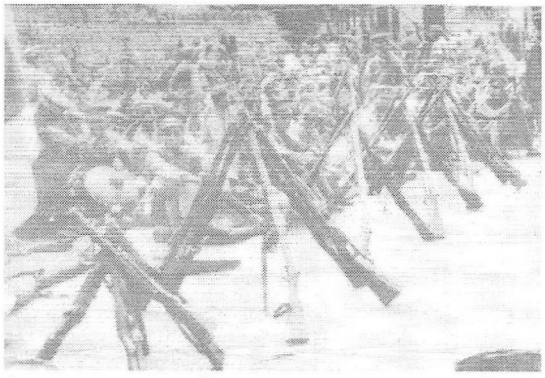


Picture 455 A Japanese captured Bergmann gun with magazine pouches. Note that there are 10 magazine pouches in total. Post card issued by Yushkan, Tokyo, Japan.

[64] Reference 40.

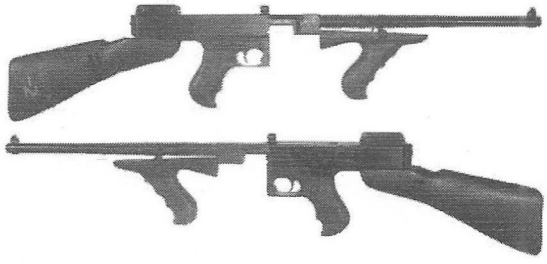
[65] The REME Museum, UK

[66] Rüstungsindustrie und Kriegsmaterialhandel zur Zeit des Nationalsozialismus



Picture 456 Invading Guangxi troops in Hunan. Note the Bergmanns in the foreground. Lian You #115.

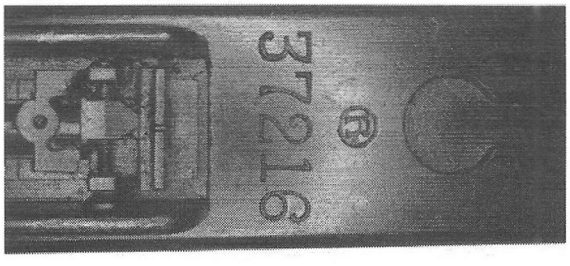
II. Shanxi Produced .45ACP Thompson Submachine Gun



Picture 457 A Thompson produced by the Shanxi Arsenal. Source G.

Thompson Submachine Gun Specifications

Operation Method：Blow-back
O/A Length： 855mm
Barrel Length：268mm
Caliber：.45ACP/11.43x23 mm
Weight：4.87kg
Muzzle Velocity：244m/s
Feed：20-round box magazine or 50/100-round drum
Rate of Fire: 600-700 r/m

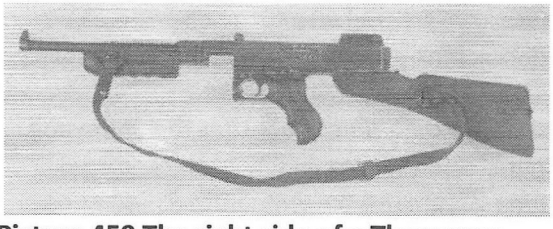


Picture 458 The serial number of the above gun is 37,216. If the serial numbers started at 1then the Shanxi Arsenal produced more Thompsons than Colt prior to Pearl Harbor. Source G.

John T. Thompson was an ordnance officer in the US Army. He retired from the army in 1914 and started his development of a full automatic weapon.

During WWI, he was recalled for duty and retired again in 1918. At that time he thought the normal blow-back design wasn't strong enough and he adopted a friction based retarded system invented by John Blish. He was going to use rifle cartridges but eventually gave up because they were too powerful. His gun was first offered in 1921 and he invented the term "Submachine Gun."

Thompson's story was actually pretty tragic. His gun showed up right after the war. No power in the world was interested in the weapon at the time and he had to turn to the civilian market. There were 15,000 guns made by Colt in the first lot. They were still not sold out until 1937. The purchasers were not governments but bandits, gangsters, IRA, warlords of various countries, etc. This built up a terrible reputation for the Thompson. The 1934 NFA Act was the first restrictive gun law in US history and it was a direct response to the misuse of Thompson submachine guns. Thompson didn't live to see the gun contribute to any good cause. At a later date in his life he wrote to his son that he regretted ever having invented the gun.



Picture 459 The right side of a Thompson 1921 made by Shanxi Arsenal. Source B.

In 1926, the "Shanxi Soldiers' Artisan Apprentice Factory" (yet another name by which the Shanxi Arsenal was called) started the production of the Thompson 1921 model. In 1927, the arsenal was renamed the Taiyuan Arsenal and publicly mass-produced all kinds of arms. There were 8,000 workers in the arsenal, working day and night. Yuan joined the Northward Expedition Forces to fight the Beiyang warlords.

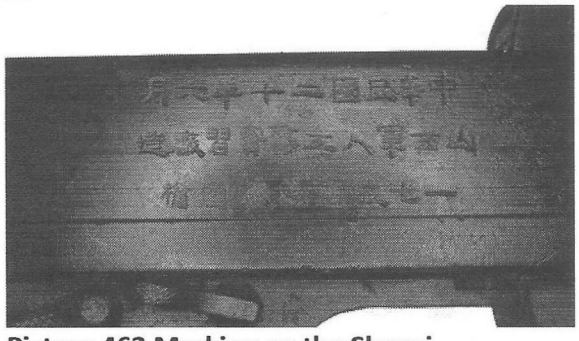
The monthly submachine gun output for the Taiyuan Arsenal was 900. Production stopped after the "Zhong Yuan Campaign"(Oct. 1930), but restarted again between 1932 and 1934, when the monthly output was about 250 guns.

The model Shanxi Arsenal produced included both the 1921 and 1928 patterns. The receivers were marked "Shanxi Soldiers' Artisan Apprentice Factory", "Taiyuan Arsenal", etc. The total production is estimated at 25,000 to 30,000.

Picture 460 Nationalist soldiers after the Bai Ling Miao campaign. Note the four Thompsons in the picture. Lian You #123.

Picture 461 A 1921 copy by the Shanxi Arsenal made in 1928. Note the marking is "Taiyuan Arsenal". Courtesy of Tracie Hall.

Picture 462 Another Shanxi produced Thompson 1921, made in August 1930. Note that the marking has changed to "Shanxi Soldiers' Artisan Apprentice Factory". Source B.



Picture 463 Marking on the Shanxi Thompson. A special note about this marking is that it actually says "Type 17 Submachine Gun" Source G.

Liu Xian in Sichuan operated the 21st Army Weapons Depot, which was later renamed the Chungking Weapon Depot. It was initially established in 1928 by relocating a batch of machinery from the Sichuan Arsenal in Cheng Du (成都). The machinery in the depot increased to 400 machines and the depot employed two to three thousand workers.

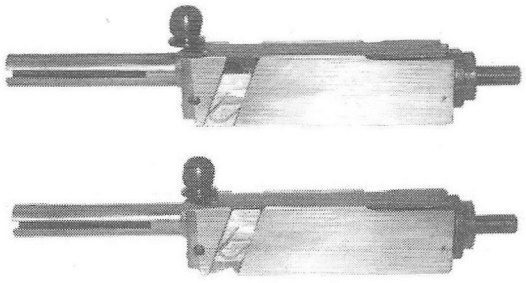
Picture 464 The 21st Army Weapons Depot produced a 7.63x25mm Thompson "light machine gun." Note the thin but extended barrel. Beijing Military Museum.

The 21st Army Weapons Depot also produced Thompson pattern submachine guns. It produced two different versions; one in a regular submachine gun configuration and one in a light machine gun configuration. Both were in 7.63x25mm caliber.

Picture 465 US Model 1928 with drum magazine. Valentine H. Christmann Collection.

The light machine gun version extended the barrel to 438mm and was equipped with a bipod. This was obviously not very effective due to the less powerful cartridge. The 21st Army Weapons Depot soon switched to ZB-26 production in 1934. It was one of the earliest producers of the ZB-26 in China.

The total production of both types was 4,700 guns.



Picture 466 The early bolt with the Blish lock, which was deleted in the later versions.

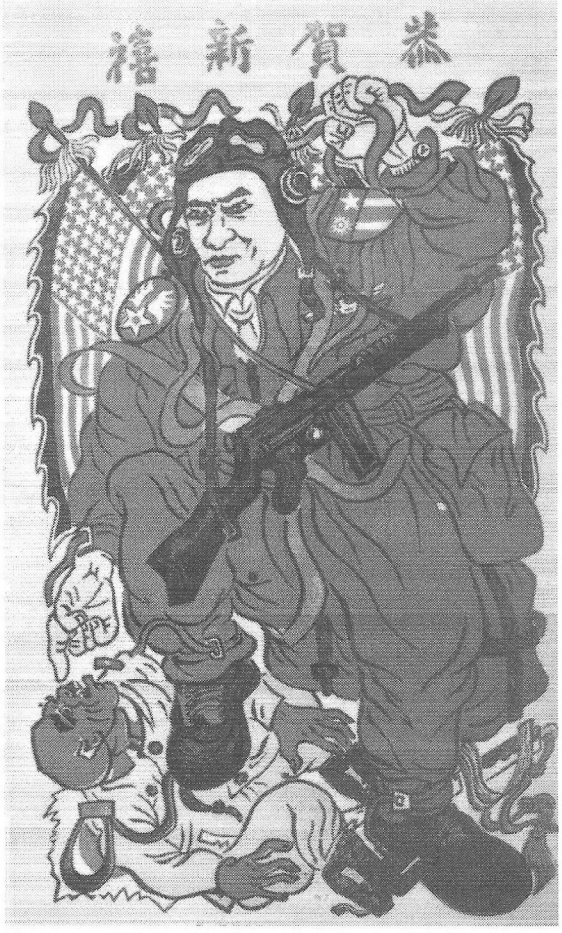
Picture 467 An LPA photo from a field exercise. The soldier is equipped with an M1 submachine gun. Hugh T. Lowry album.

Picture 468 X-forces and Y-forces met in Mong-Yu in January, 1945, where the cap met the helmet, straw sandals met boots, and the FN rifle met the Thompson submachine gun. Note the Cutts compensator and top charging handle on the M1928 submachine gun. Source A.

The Japanese data pointed out that Taku also produced Thompsons, even though it was not reflected in any Chinese record. Since the Japanese booklet was based on captured weapons, it should be fairly accurate.

The Thompson was standard issue for American troops in WWII. It was adopted in 1942 as the "Thompson Submachine Gun, Caliber .45, M1". SACO issued them to the LPA soldiers from the very beginning.

The X-Force in India was issued with large numbers of M1928/M1/M1A. The Y-Force which set out from Yunnan was also equipped with some but not many. The reason for the limited availability was due to the limited tonnage available via the Hump. Even though the American and Chinese pilots all tried their best and suffered great losses –the line was also called the "Aluminum Route" due to the number of airplanes lost along the route - the tonnage was still limited. The supply was increasing in India but the Chinese Army still suffered a shortage of needed equipment. In the memoir of General Song Xilian (宋希濂) "The Y-Force Training and Counter-offense": "Each Infantry Company had nine light machine guns, 18 Thompson submachine guns,....". This might have been the ideal situation but not all of the Y-Force was equipped to that level with submachine guns.



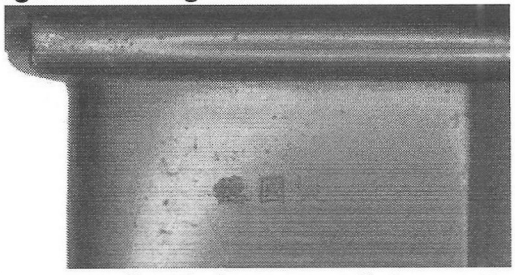
Picture 469 A US Army Psychological Warfare unit issued this "Happy New Year" and "Door Gods" print in 1945. The US pilot in the picture is equipped with a Thompson.

Thompson Submachine Gun Part List[67]		
Part#	**English Name**	**Chinese Name**
2	Barrel	槍管
3	Bolt	槍機
4	Breech Oiler (Including Felt Pads)	油片
7	Disconnector	機頭
8	Disconnector Spring	機頭簧
9	Ejector	頂殼針
10	Extractor	退子鉤
11	Firing Pin	撞針
12	Firing Pin Spring	撞針簧
15	Frame	扳機箱
16	Frame Latch	扳機箱門
17	Frame Latch Spring	扳機箱門簧
18	Grip Mount	護木座
19	Hammer	擊鐵
20	Hammer Pin	擊鐵銷
21	Lock	機門
22	Magazine Catch	彈夾扣
23	Magazine Catch Spring	彈夾扣簧
24	Pivot Plate	駐針片
25	Rear Grip	後握手
26	Rear Grip Screw	後握手螺
27	Receiver	槍身
29	Rocker	快慢機鉤
30	Rocker Pivot or Fire Control Lever	快慢機
31	Safety	保險機
32	Sear	擊發阻鐵
33	Sear Spring	擊發阻鐵簧
34	Sear Lever	擊發阻鐵桿
35	Sear Lever Spring	擊發阻鐵桿簧
36	Trigger	扳機
37	Trigger Spring	扳機簧
38	Trip	扳機鉤
44	Fore Grip	護木
45	Fore Grip Screw	護木螺
47	Actuator	機柄
48	Buffer (Including Fiber Disc Part No.50)	緩衝器
49	Recoil Spring	復進簧
51	Stock	槍托

[67] Reference 30。

III. Hua Yang, Chi Shui (赤水) Produced 7.63 Mauser Automatic Pistols

Picture 470 Mauser Schnellfeuer Model with "Made in Germany" in Chinese on the magazine housing. Source F.

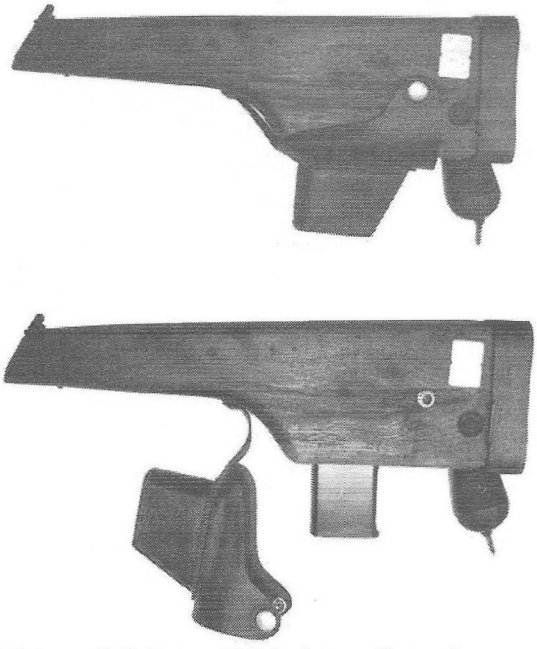


Picture 471 "Made in Germany". Source F.

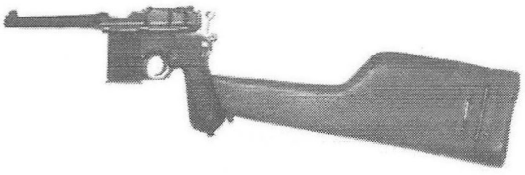
Mauser Schnellfeuer Pistol Specifications
Operation Method：Short recoil
O/A Length： 288mm
Barrel Length：132mm
Caliber：7.63x25mm
Weight：1.24kg
Muzzle Velocity：425m/s
Feed：10/20-round box magazine
Rate of Fire: 1,200 r/m

In 1926, the Royal brand in Spain marketed the first fully automatic Mauser pistol look-alike. It was sold to China in large quantities. Astra also followed suit in 1927 with its full auto version. The Astra had its selector on the right side compared to that of Royal and the later Mauser version on the left side. There were about 40,000 Astra full auto versions sold to China. There were also Azul brand full auto from Spain, which was the same gun as the Royal MM31.

Picture 472 Astra 902 full-auto pistol with 20 round fixed magazine. PJ Heck Collection.

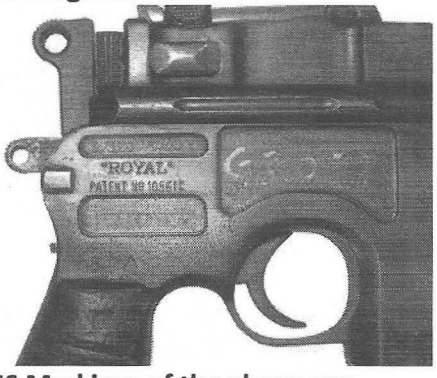


Picture 473 Astra 902 holster. Note the opening for the protruding magazine and leather cover. PJ Heck Collection



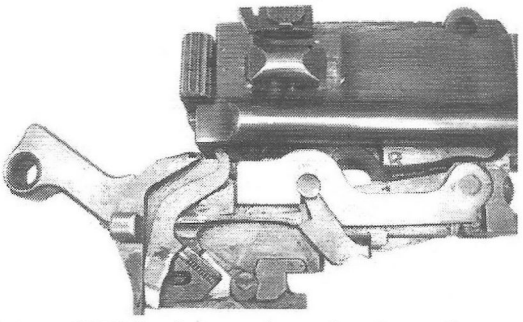
Picture 474 Spanish Super Azul full-auto pistol. PJ Heck Collection.

Picture 475 Spanish Royal MM31 with 20 round fixed magazine. Source F.



Picture 476 Markings of the above gun. Source F.

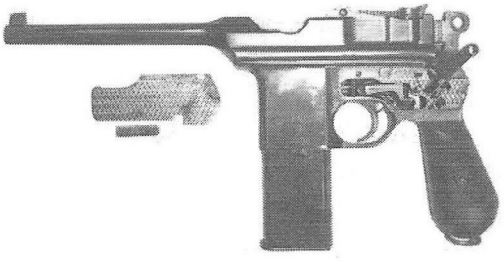
In response to the competition from Spain, Mauser also set to work on a full auto version. Joseph Nickl completed the first design and about 4,000 were produced. It was not satisfactory and the project was turned over to Karl Westinger for improvement. The final version entered production in May 1931. It was named by Mauser as "Die Schnellfeuer pistole Mauser." From the appearance, the biggest difference was that the earlier version had a paddle selector switch and the final version had a button type. All Mauser Schnellfeuer were equipped with detachable box magazines, holding either 10 or 20 rounds.



Picture 477 The internal mechanism of a Mauser Schnellfeuer. Note the catch hook on the left, which ensured the gun was in battery and also operated the hammer. PJ Heck Collection.

The first thousand guns that came off the Mauser production line were shipped to China, and were serial numbered 100001a to 101000a. The total production quantity was around 100K and it is believed that 70K went to China. After the Germans cut all ties with China, there were still 2,000 left in the Mauser factory with no buyer. These guns were all later sold to the arms deprived Nazi Schutzstaffel(SS).

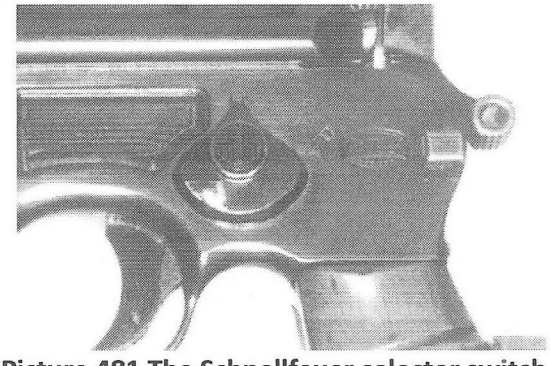
The Astra guns achieved automatic capability by extending the sear so that when the bolt recoiled, the disconnector lowered, and when the bolt returned to battery, the disconnector rose to the firing position and triggered the sear to fire.



Picture 478 An Astra 903 gun with the side panel removed. PJ Heck Collection.

Picture 479 Astra 903 with side panel and safety removed, showing the disconnector and sear. PJ Heck Collection.

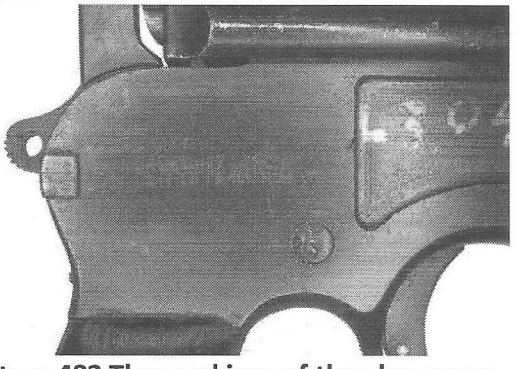
Picture 480 The right side of an Astra 903. PJ Heck Collection.



Picture 481 The Schnellfeuer selector switch, N(Normal) for semi-auto and R(Reihenfeuer) for full-auto. Robert W. Faris collection.

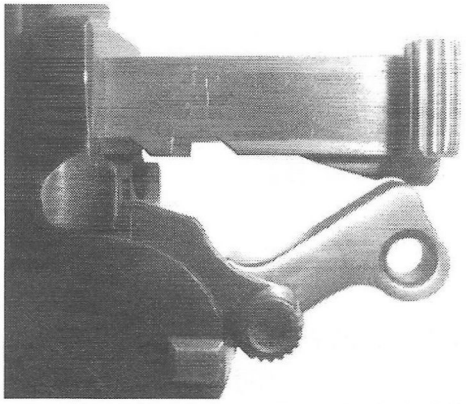
A Chinese produced copy of the Schnellfeuer had a "Yin-Yang" style of marking on the right side as well as "Zi Lai De Pistol" (自來得手槍), and date of manufacture such as 32-11 for November 1943. The ordnance gear mark was on the left side.

Picture 482 A Chinese produced Schnellfeuer marked "Army Repair Depot." It's made by the Guangdong facility of the Nanjing puppet regime.



Picture 483 The markings of the above gun.

The Mauser charging strip could hold only 10 rounds, so when used with a gun equipped with a 20 round magazine, two strippers would be needed. However, the Mauser pistol closed the bolt as soon as the stripper was pulled out, so this presented a problem. The Schnellfeuer resolved this problem by introducing an indent under the bolt. When the bolt is pulled to the open position, it is held open not by the magazine hold-open device but by the hammer. The shooter could load the magazine at will and when the gun was loaded, pull the bolt a little bit further back and then release it. The bolt would then move forward and close.



Picture 484 The Schnellfeuer bolt hold-open illustrated. The hammer is caught in the indent under the bolt and held in the open position until the bolt is pulled back slightly to release it.

Fully automatic pistols had been tried many times since the first semi-automatic pistols appeared. They never gained wide spread acceptance. The concept was very attractive- a light package with fully automatic firing capability. However, the light weight of a pistol was exactly the problem. It was just not a stable enough platform for automatic fire.

The Schnellfeuer suffered the same fate. It was considered as a submachine gun but the stability of the fire was far from ideal. A modern test showed that even with a shoulder stock and firing in 3-round bursts at a 25-yard target, the second round impacted 25cm higher from the first and the third round impacted 30cm higher from the first round.

In an attempt to address this problem, Astra first introduced a rate reducer with the Model F. The Royal soon followed with the MM34 equipped with a reducer but of a different design. The concept was to use mechanical means to retard the action and slow down the rate of fire. They both claimed that the rate of fire could be reduced to 350 round per minute. That would be a tremendous improvement over the original 1,200 rounds per minute rate of fire.

The Chinese believed that turning the gun on its side and shooting it that way could improve the hit ratio. The idea was that instead of having the muzzle jump up, the bullets would spread sideways. This obviously raised another issue; the shooter must be certain that there were no friendly troops in front for the wild movement of the muzzle could cover a very large area. The 20-round magazine could be emptied in just one second if fired in full auto. There was also the problem of enough ammunition to sustain fire.

The best way to shoot the Schnellfeuer seemed to be to attach a shoulder stock. With the stock held securely against shoulder and with the other handholding the magazine well, try to fire the gun in short bursts –which might take some practice. Other than this, there seemed to be no better way to use this weapon.

Section 3. Imported Submachine Guns

I. UD M42 Submachine Guns

Picture 485 A UD M42 submachine gun. Valentine H. Christmann collection.

UD M42 Submachine Gun Specifications
Operation Method：Blow back
O/A Length： 807mm
Barrel Length：279mm
Caliber：9x19mm
Weight：4.1kg
Muzzle Velocity：400m/s

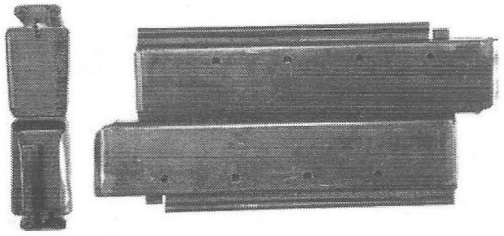
Feed： 25-round box magazine
Rate of Fire: 700 r/m

The United Defense Supply Corporation(UD) was a US Government affiliated organization. Its charter was to supply equipment to non-military organizations of allied nations worldwide. It worked with intelligence agencies to supply necessary equipment.

The M42 was designed by Carl G. Swebilius and produced commercially by Marlin. It wasn't standard issue but in the early days of WWII it was procured to supplement standard issued weapons. There were about 15,000 guns built in total and the UD was the sole buyer hence it was known as the UD M42.

Picture 486 The marking on the UD42 –"United Defense Supply Corp. New Haven, Conn." Valentine H. Christmann collection.

Picture 487 The rear sight of the UD42 was a precision made affair. For a submachine gun, it was over engineered. Valentine H. Christmann collection.



Picture 488 The magazines could be connected together. Valentine H. Christmann collection

The guns were distributed mainly by the Office of Strategic Services (OSS) in the European theater and many were dropped behind enemy lines for insurgents. SACO also acquired them and provided them to the LPA in China.

Picture 489 SACO's 4th Camp in the Gobi desert, located at Shanba (陕壩), Suiyuan. SACO Archive.

The M42 was only produced commercially and was very high quality made. It was a reliable weapon. There was also a .45ACP version.

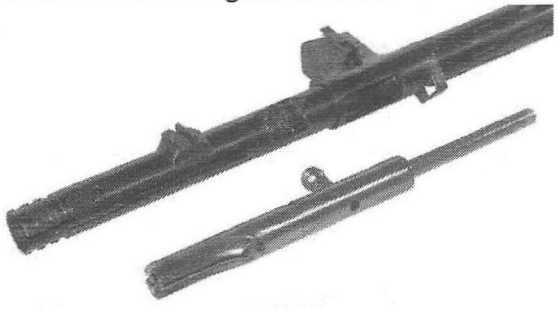
II. German/Chinese ERMA Submachine Gun

Chinese made ERMA Submachine Gun Specifications

Operation Method：Blow back
O/A Length： 853mm
Barrel Length：212mm
Caliber：7.63x25mm
Weight：3.80kg
Muzzle Velocity：390m/s
Feed： 30-round box magazine
Rate of Fire: 500 r/m

This gun was designed by the German designer Heinrich Vollmer in the 1930s. It was produced by Erfurter Maschinenfabrik and is usually referred to as the ERMA submachine gun or ERMA EMP (Erma Maschinenpistole).

The EMP was one of the many submachine guns developed between the wars. Vollmer continued to develop his design and finally came up with the very successful MP-38/40 series submachine guns in WWII.



Picture 490 The EMP had a telescoping extension which held the main spring. This concept was retained in the MP 38/40.

One of the distinctive features of the EMP was that it had a wooden vertical fore grip. The design also incorporated a telescoping bolt extension; which prevented dust and debris from interfering with operation of the main spring. This feature was retained in the MP-38/40.

Due to the limitations of the Versailles Treaties, the gun was also produced under license by the Swiss Solothurn firm. China purchased a fair number of various types of guns from Solothurn.

Section 4. Combat Experiences and Comments

Chinese called the submachine gun either "hand held machine gun" or "assault gun." These names pretty much reflect their thoughts about its tactical usage.

The deployment of submachine gun reached its peak during WWII. It played an important role in almost every theater. Except for Japan, all major powers produced them in large numbers. Germany produced about 900,000 of theMP38/40, Britain produced about 4 million STENs, the US produced about one million M1/M1A1s and 600,000 M3s and Russia produced about six million of various models. It was especially prolific in Russia, where sometimes a whole battalion of soldiers would be armed with submachine guns. It must have been devastating for the Germans to face hundreds of soldiers charging and spraying bullets at the same time.

Submachine gun usage in the China theater was very limited with a few exceptions. The Japanese military authorities didn't believe in soldiers spraying bullets. Japan produced the "Type 100" submachine gun only near the very end of the war , In general, it was not used by its troops. China of course knew the advantages of the submachine gun, but there was no domestic production and imported guns were far and far between.

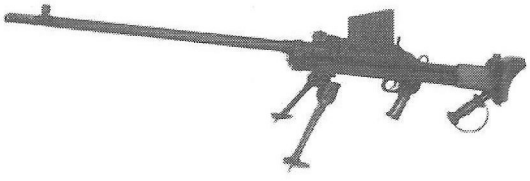
Only at the end of the war were the X-Forces equipped with large numbers of US supplied Thompson guns and they were used to great effect in the Burma jungle.

Other than that, the only unit equipped with large numbers of submachine guns was the LPA. Due to its mission requirement, the LPA was mainly to carry out sabotage behind enemy lines. Their mission was not to stand and fight but to make as little contact as possible. The submachine gun was ideal for as soon as a fight broke out, they could immediately offer a large volume of fire to overpower the enemy forces and disengage quickly.

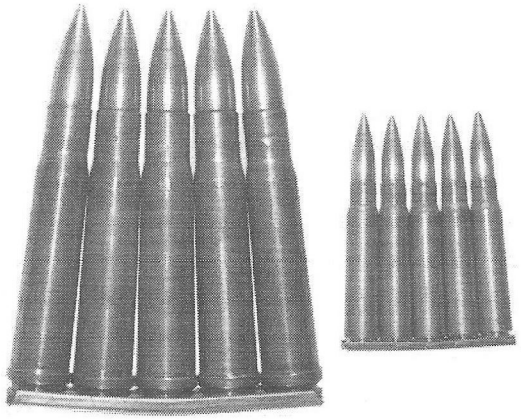
Judging by the industrial capability of China at the time, it would have been possible to produce the second generation type of submachine gun. However, the situation at the time was mostly defensive in nature so more emphasis was put on rifle and light machine gun production. The submachine gun was simply not a priority item as witnessed by it not being requested under Lend-Lease . Also, submachine guns would consume a tremendous amount of ammunition, which might be a problem for the ordnance industry to keep up with this demand.

Section 5. Anti-Tank Weapons

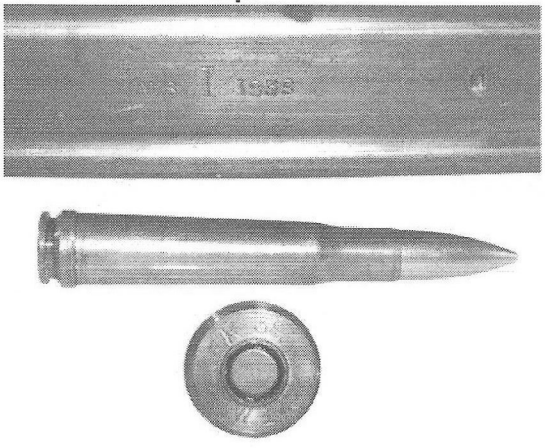
I. Canadian Boys Anti-Tank Rifle



Boys Anti-Tank Rifle Specifications
Operation Method：Manual turn-bolt
O/A Length： 1,626mm
Barrel Length：915mm
Caliber：13.9x99mmB
Weight：16.4kg
Muzzle Velocity：990m/s
Feed： 5-round box magazine



Picture 491 A side by side comparison of a Boys belted armor piercing five round clip vs. a 7.92 five round clip.



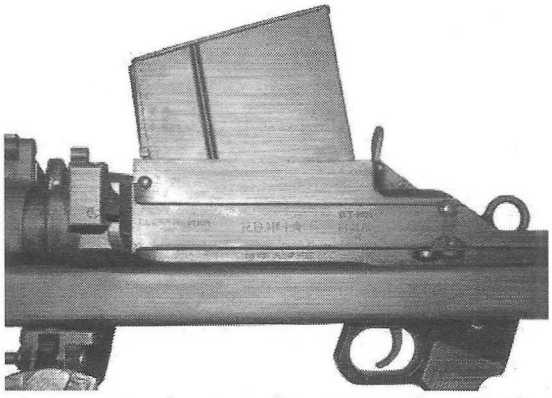
Picture 492 The head stamp of the Mark I 13.99x99mm cartridge shows that it was made by Kynoch of Birmingham, Britain.

The Boys anti-tank rifle was designed by a team led by Captain H.C. Boys and adopted by the British at the end of 1937. However, due to the advances of German armor, it soon became obsolete and it was superseded by the Projector Infantry Anti-Tank(PIAT) in 1942.

Although Japanese tanks had pretty weak armor, the Chinese didn't have enough anti-tank weapons other than some 13mm

anti-tank guns imported from Germany or Hotchkiss . The only way for Chinese infantry to destroy a tank was to rush the tank with a bundle of hand grenades

Although Boys guns were obsolete in the European theater, they were still very effective in the China theater against Japanese armor. The US provided China 1,000 Boys guns under the Lend-Lease Act in 1942. The X-forces were immediately issued these guns. Due to shipment limitations, only 572 guns reached Kunming in June, 1943. 26 of these were issued to the Infantry Training Center to train Chinese troops.



Picture 493 The Canadian Boys rifle, Mk I*, made in 1942 with US Property marking. Courtesy of Steve Werkema.

The 31st Army Group sent people to Kunming for Boys guns training in 1944 and was issued eight guns. They formed an anti-tank company for both the 78th Army and the 85th Army[68]

In the British army, anti-tank guns were issued at the platoon level. Every infantry man had to learn how to operate the gun as they were not considered special weapons. During Dunkirk, British troops left large numbers of this gun on the beach. The Germans considered them totally worthless and discarded them. However, in China in 1944, they were precious weapons. An Army Group only had eight guns and formed two company units to operate them.

When the Y-forces were first formed, anti-tank guns were issued to infantry battalions. Each battalion had an anti-tank squad with 13 men and 3 guns. When the Y-forces entered Burma, this had been changed to an anti-tank company under an infantry regiment. The company had four platoons and each platoon was armed with a 37mm anti-tank gun, an anti-tank rifle, and an anti-tank rocket launcher.

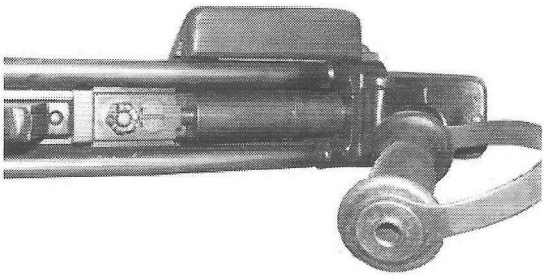
In 1945 Japanese troops attacked Xi Xia Xian (西峽縣) to assist their operations in western Henan. The anti-tank unit of the 78th Army was attached to the New 43rd Division. On the night of April 3, it set up an ambush in Zhong Yangdian, in which a whole column of Japanese tanks was destroyed. The commander thought that they had destroyed nine tanks but the battle report only credited them with two. The Japanese troops hauled all of the tanks away under the cover of night so there was no definite count as to how many were destroyed. There were no casualties on the Chinese side.

The Boys gun resembled a ZB-26 or Bren gun. The magazine is inserted from the top and the sight is offset to the left. The sight setting on the later Canadian guns was 300 or 500 meters. It was a manually operated turn bolt gun so there was not much training required. The top part of the gun recoiled freely about 25mm when fired to reduce recoil. The muzzle brake also helped to reduce

---

[68] Smashing Japanese Tanks in Zhong Yangdian (重陽店痛殲日軍戰車記), p. 502 , Zhang Fangpeng (張訪朋), Zhong Yuan Campaign.

recoil.



Picture 494 The top of the gun sits on a slide with a recoil buffer at the end to reduce recoil. Steve Werkema collection.

The most important training for the anti-tank gunners was how to estimate distance and how to determine the lead. The gun must aim at a lead distance when shooting at a moving target because the goal was to have the projectile and the target arrive at the same time. ◦

Shooting at a stationary target and at a moving, approaching tank was totally different. The gunner must overcome his fear of the terrible noise and psychological pressure and focus on the matter at hand. In the Zhong Yangdian battle, they chose a turn on the road, then measured and set aiming points beforehand. This greatly raised the effectiveness of the operation.

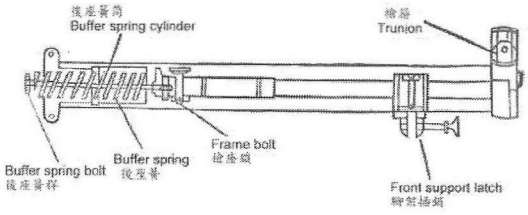
After 1945, the Burma road was reopened and there were 185 guns shipped in. At that time, the 2.36 anti-tank rocket launcher gradually became available, so the Boys guns were soon retired from the front line troops. This may have been one of most short lived weapons in the Chinese army.

Lead Table[69]			
	100 meters	200 meters	300 meters
Medium Speed	Aim at front third of target	Aim at front one third of target	½ target length
High Speed	Aim at front 1/3 of target	½ target length	1 target length
Slow Speed, approx. 12 Km/hr, Med Speed, Approx. 25 Km/hr, Fast Speed, Approx. 50 Km/hr			

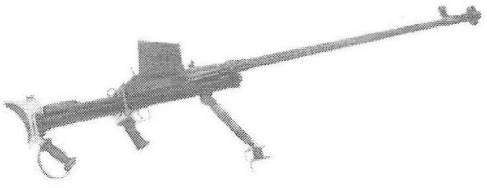
Penetration table Armored vehicle[70]			
Range	Normal	20 Degrees	40 Degrees
Meters	MM	MM	MM
100	23.2	17.9	11.0
200	20.9	16.0	9.6
300	18.8	15.3	8.8

[69] Reference 30, p. 175

[70] Reference 30, p. 176.

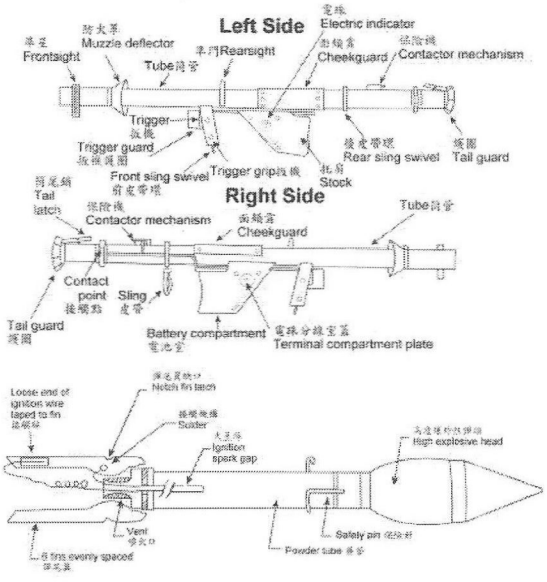


Picture 495 Receiver part names of the Boys rifle. Reference 30.



Picture 496 A British produced Boys rifle. Note the different muzzle brake. Source B.

II. US AT M1 Rocket Launcher



Picture 497 M1 Rocket Launcher and rocket illustrated. Re-drawn from the illustrations in reference 30.

M1 Rocket Launcher Specifications
Operation Method：Rocket propelled
O/A Length：138mm
Caliber：60mm(2.36 in.)
Weight：7kg
Maximum Effective Range：300m
Feed： Single shot

Rocket Specifications
Diameter：60mm
Length：550mm
Weight：1.5kg
Muzzle Velocity：100m/sec

The US was fairly slow in rocket propelled weapons compared to Germany and the Soviet Union. Other than the Browning heavy machine gun, there was no other infantry anti-tank weapon. After WWII broke out and faced with the large numbers of advanced German armored vehicles, the US became aware of the urgent need for an infantry anti-tank weapon.

In 1939, National Defense Research Committee was established in US, a group focusing on rocket research group was also formed. Based on the research efforts of member Leslie Skinner and Edward Uhl, the man portable, single soldier operated Rocket Launcher was realized. After a prototype and nine inert warheads was successfully demonstrated[71] in Aberdeen Proofing Ground in 1942, it became a high priority project. In the spring of 1942, the military approached GE for a proposal of a rocket propelled infantry anti-tank weapons. On May 19, US ordnance Colonel Rene Studler[72] met with GE and provided some basic drawings as well as an order for 5,000 rocket launchers. The only condition was that they must be delivered in 30 days.

GE took on the challenge and started working on it immediately. It took only one day to

---

[71] The Man Who Didn't Invent the Bazooka And the Men of Inspiration Who Did, George, Knotis PE, Small Arms Review, Vol 14, No. 10.
[72] Production History of the 2.36-inch US Bazooka, Frank Iannamico, Vol 10, No. 6, Small Arms Review.

finish the draft design. The first trial sample was delivered in four days to Aberdeen Proving Ground. There were 14 different prototypes delivered for trial until the final design was accepted. At the same time, GE set up a production line ready for series production.

It only took GE 22 days from the initial drawing to the start of production of 5,000 rocket launchers.

The new weapon was designated as "Launcher, Rocket, AT, M-1." By the end of the war, GE had produced half of a million of this weapon, the record production rate was two per minute.

Americans usually referred to this weapon as a "Bazooka," because it looked like an instrument used by an American comedian, Robert Burns, who called his instrument the Bazooka.

The design and operation of the rocket launcher was simple. It could be fired either standing, kneeling, or prone. The loader would press down the tail latch with the left hand; insert the rocket with the right hand and push the rocket all the way in until the tail latch caught. There was a taped ignition wire on the rocket tail which needed to be attached to the contact point on the launcher. The weapon was then ready to fire. The operator aimed at the target, pulled the trigger, electricity ignited the rocket which was launched to the target.

The electricity ignited the rocket came from one contact point inside the launcher and one outside of the launcher. Even if there was no rocket in the launcher, the operator could pull the trigger and a light bulb would come on to indicate the completion of the electrical circuit.

M-1 Lead Table		
Distance	15 Km/hr	30 Km/hr
100 meters	1	2
200 meters	2	5
300 meters	3	6

The first unit in China that received M1 rocket launchers was the LPA. They started training with it as early as 1943. On March 21, 1945, an LPA rocket launcher cavalry squad encountered a Japanese armor column in the Gobi desert moving towards Beijing. They destroyed one tank, four armored vehicles and killed 70 Japanese soldiers with their rockets.

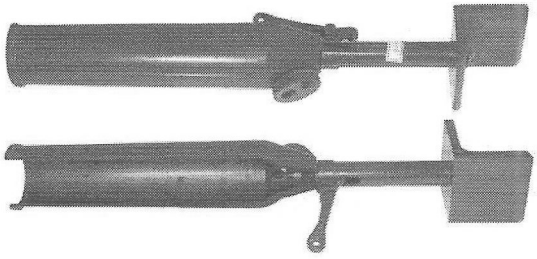
The X-forces from India were also armed with large numbers of rocket launchers. The Y-force only had some small number. At the end of the war, the Chinese army reported that they had 1,037 rocket launchers on hand.

Section 6. Grenade Launchers and Grenade Dischargers

"The agile movement of the troops and the good usage of grenade dischargers were all our enemy's strength. We must learn their strength so that we don't have to be afraid of them. Once we learn these skills, we can use them against the enemy.."

Chiang Kai-Shek, The First Nan Yue Military Conference speech
November 27, 1938, The fourth meeting

I. Type 27 Grenade Discharger



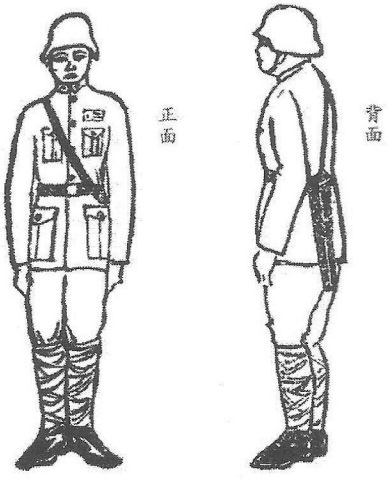
Picture 498 The Type 27 grenade discharger. This is a cutaway unit for educational purposes. The green paint is not original. Source F.

Type 27 Grenade Discharger Specifications
Operation Method：Gas propelled
Tube Length：436mm
Caliber：50mm
Weight：2.60kg
Feed：Single shot

The grenade discharger was one of the most important infantry indirect fire weapons. It's very effective in close encounter. The maxim range was 250 meters and the closest range was 50 meters. The curved trajectory allowed it to eliminate enemy behind cover and it could be fired behind cover, so it was a good companion to the direct fire weapons such as the rifle. The projectile could be used as a hand grenade within 50 meters. The resulted fragments could generate a kill zone of 20 meters diameter. The discharger maintained 45 degree angle of elevation and the powder charge remained the same. The distance adjustment was accomplished by the adjustment wheel. The more gas leakage the shorter the range or vice versa. When used in combat, it was important to carefully utilize cover to avoid enemy machine gun fire. The grenade had a time delay fuse, which detonated in 7.5 to 8 seconds after launch. When used against fast moving targets such as enemy cavalry or armored vehicles, it's necessary to allow sufficient lead The discharger was simple and solid, better than the Japanese pattern. The projectiles were compatible with those of the Japanese (the T91 hand grenade with booster) so therefore captured Japanese grenades could also be used."[73]

"The grenade discharger was an infantry indirect fire weapon. When the war broke out; our troops didn't have this type of weapon. When we engaged the enemy, our troops suffered a great deal of causalities from enemy grenade discharger bombardments. The Ordnance Office ordered the Hanyang Arsenal to urgently produce the dischargers. The original pattern was identical to that of the Japanese discharger. However, the Japanese pattern was complicated in design and application, so it was difficult to produce. And for soldiers who were not well educated, it was not very effective. At the time, most of the arsenals were on the move, so the task of producing the grenade discharger was turned over to the 30th Arsenal."

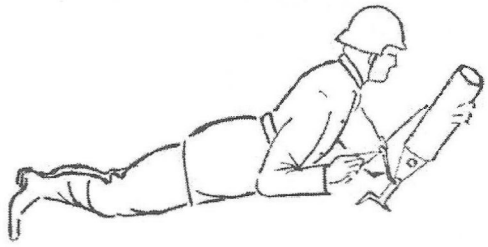
The 30th Arsenal completed its design and Ordnance Office trials in 1938. It was adopted as the "Type 27 Grenade Discharger," and series production started in January 1939.



Picture 499 The grenade discharger in its leather case in the carrying position.[74]

[73] Reference 39.
[74] All drawings are from Reference 39.

The T27 was mainly fired from the prone position. If in a well covered position, it could also be used in the kneeling position



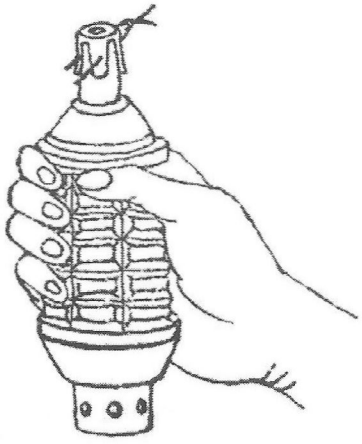
Picture 500 Firing the T27 from the in prone position.

Picture 501 Firing the T27 from the kneeling position.

There were several modifications made to the T27 during the war:
"In 1940, the calibration was marked on the base plate, the range base was made thicker and the aiming line was narrowed. In 1941, the range adjustment wheel was changed to a trapezoidal shape, the rivets were changed to vertical on the base and a cleaning rod was added. In 1942, the Ordnance Office gear marking was added as well as the packing records. In 1943, a packing cover was added."

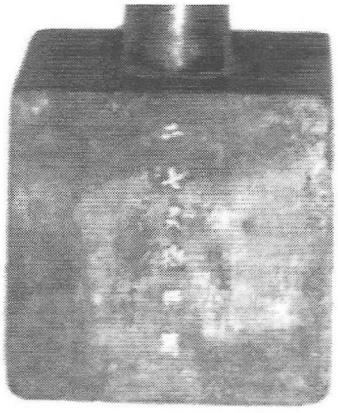
"The Type 27 was very simple in design, easy to assemble and disassemble. It was far superior to the enemy's model. It took only a third of the time to produce as compared to the Japanese pattern. All components were larger and, even with less quality materials, it was still very serviceable. There was no need to visually sight the target during firing and this was extremely useful when being used at night. The maximum rate of fire could reach 20 shots per minute. It also could be used when the shooter was in the prone position."

During the war, the 30th Arsenal produced 40,909 dischargers and 1,551,313 grenades.[75] Due to the compatibility of grenades used in the Type 27 with the Japanese pattern grenades, there was one unit which had been captured by the Japanese and then discovered in the Pacific Islands. US Intelligence thought it was a new Japanese model.



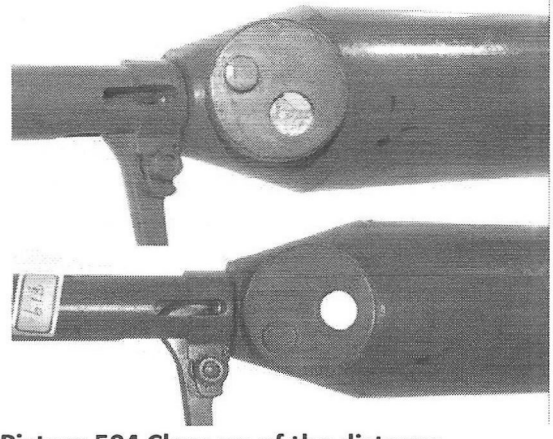
Picture 502 The T27 grenade, which could be used as a hand grenade within 50 meters. Hold the grenade in the right hand, bite off the safety pin, strike the top end on a hard surface such as the sole of a boot or a helmet – then watch for the escaping gas from the ignition of the fuse, and throw to the target immediately. The operator should promptly take proper cover.

[75] Reference 2,Vol III,The 30th Arsenal production quantity over the years. April 1947.

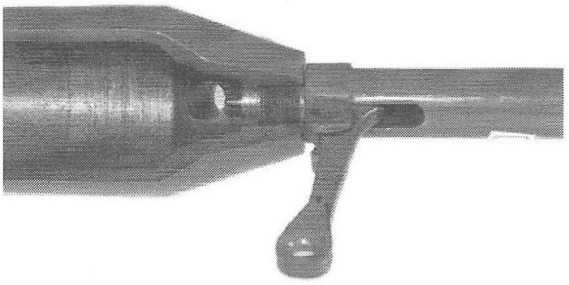


Picture 503 The "Type 27 Grenade Discharger" marking on the base of the discharger.

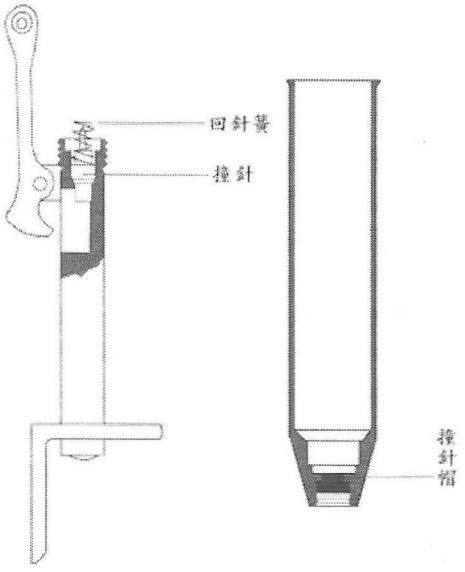
When the discharge was deployed, the base was to be secured to the ground, the tube pointed towards the enemy, the grenade slid down the tube and launched with a sudden pull of the trigger. The tube should be maintained at an inclination of 45 degrees. The Type 27 used a range wheel to adjust the distance which had eight settings of 50, 75, 100, 125, 150, 200 and 220 meters.



Picture 504 Close up of the distance adjustment wheel. Above fully closed and below fully open. Source F.

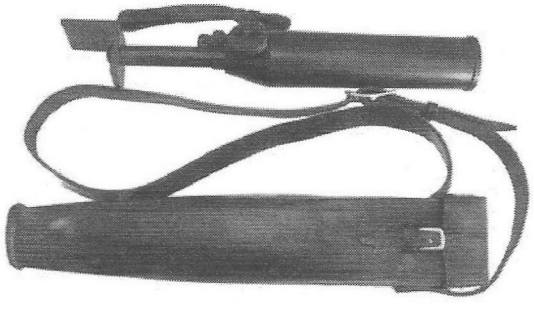


Picture 505 Close up of the firing pin area. Source F.



Picture 506 Complete drawing of T27.

The grenade discharger was a weapon somewhere in between a mortar and a grenade. It was particularly useful when two opposing sides were in close range and pinned down by fire. US troops also suffered a great deal from grenade barrages when the lines became stagnated in the Pacific Islands.



Picture 507 Concurrent T27 Grenade Discharger 1:1 replica by G-Max. The leather

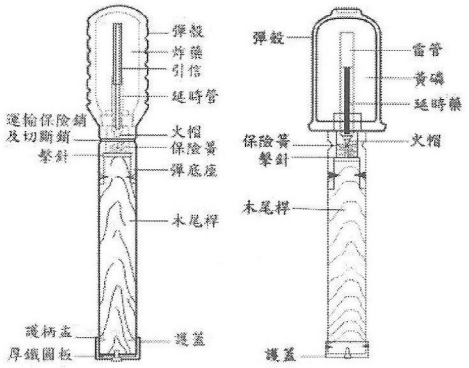
carrying bag was reproduced by the author based on period photos.

II. Type 28 Grenade Launcher

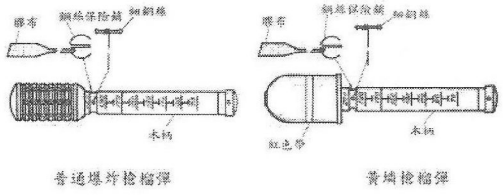
Picture 508 The 24th Arsenal markings on a T28. This unit was made in September, 1942. Source F.

Type 28 Grenade Launcher Specifications
Operation Method：Gas propelled
Tube Length：250mm
Caliber：25.8mm
Weight：0.75kg
Maximum Range: 250 m
Feed：Single shot

Type 28 Grenade Specifications
Length：246.13mm
Weight：0.589kg
Charge：55g TNT
Fuse：Time-delay, 9-11 sec.



Picture 509 Two types of T28 grenades. High explosive anti-personnel grenade on the left and yellow phosphorus smoke grenade on the right.[76]



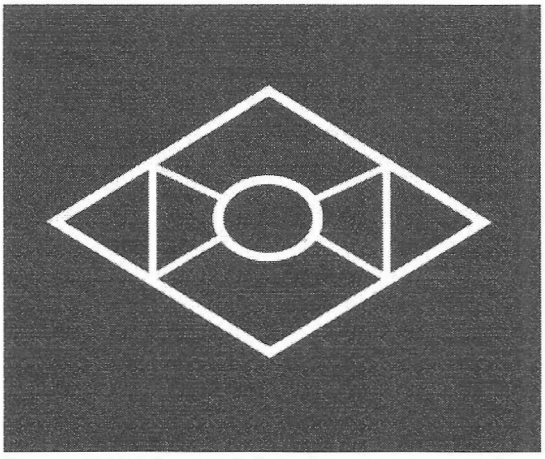
Picture 510 A full view of the two different type of T28 grenades.

The grenade launcher was also an indirect fire weapon for infantry, which could be used to destroy enemy behind cover. The advantage of the grenade launcher was that it was not a separate device. The launcher could be left mounted on the rifle and the rifle still fired as normally. When the soldier needed to fire a grenade, he simply replaced the ball cartridge with the special purpose cartridge and inserted a grenade into the launcher. It was simple and effective with a very short lead time.

[76] All drawings are from Reference 38.

Picture 511 The T28 grenade launcher could be either attached to the rifle during marching or attached to the belt.

In February 1939, a Russian naturalized technician Gregore.R. Larikov (拉力果夫) started designing a grenade launcher. It went into series production in June and was adopted as the "Type 28 Grenade Launcher." The 27th Arsenal was originally the "Aerial Ordnance Research Institute," but was renamed the 27th Arsenal in 1943. Its primary product was Type 28 grenades. The grenade launcher production was turned over to the 24th Arsenal.



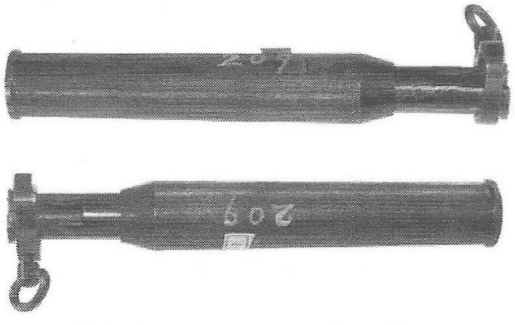
Picture 512 The Aerial Ordnance Research Institute and the 27th Arsenal symbol.

The 24th Arsenal submitted a report on August 24, 1946, which was a repeat of a 1943 report that stated:"The Type 28 grenade launcher was designed by Larikov of the Aerial Ordnance Research Institute. It consisted of a tube, base and rifle barrel connector. The tube was where the wood handle of the grenade would be inserted. The barrel connector was where the launcher was secured to the rifle barrel. The base was where the tube and barrel connector screwed together to provide support when a grenade was launched.

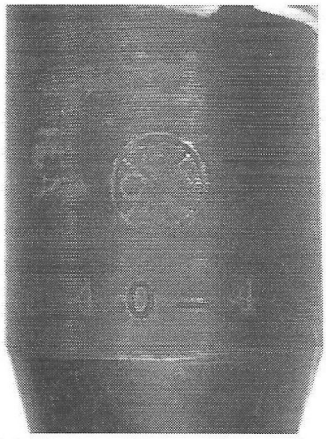
The original design was based on using imported seamless steel tubing which had to be threaded to go into the base. The 24th Arsenal started producing chrome-moly steel for rifle barrels in 1942 so it could produce the whole assembly domestically. To continue to produce the launcher as it was would be a waste of materials.

To avoid wasteful machine time and materials, it is hereby recommended that the base be eliminated...the tube can be changed to a cone shape. The new design would have the same weight as the original. The tube body will be changed to 194mm, with the largest outside diameter of 36mm and the smallest outside diameter of 33 mm. All other parts would be the same as the original."

This report revealed some import design details. Even though the original report was submitted in 1943, the design wasn't changed during the war.



Picture 513 The postwar produced T28 without the base. Source F.

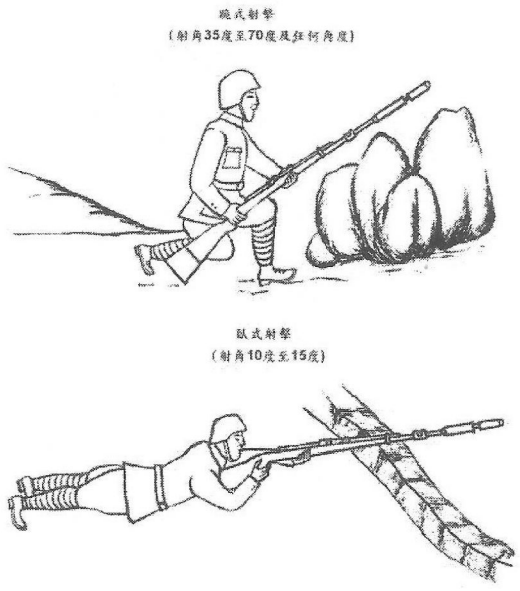


Picture 514 The markings of the above T28. It was made by the 44th Arsenal in April, 1951.

The Type 28 grenade launcher was attached to the Zhong Zheng Shi rifle's muzzle and secured by a finger screw behind the front sight. There was a copper shim inside the connector which had to be removed when used with the Hanyang rifle. A special purpose cartridge had to be used with the launcher.

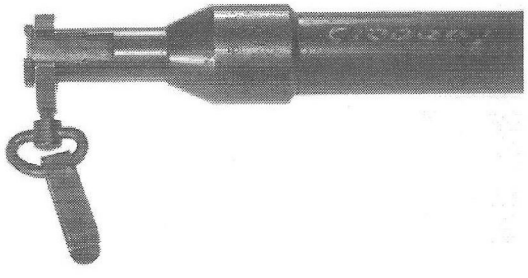
The rifle had to maintain a 35 degree angle of inclination when in use. The way to maintain the appropriate angle was to set rifle sights appropriately – 2,000 meters for the Zhong Zheng Shi rifle and 1,800 meters for the Hanyang rifle, then insuring that the rear sight ladder is horizontal to the ground. The wooden handle of the grenade had various distance markings from 50 meters to 250 meters. Simply insert the grenade into the launcher to the desired distance marking and fire. When the grenade was fully inserted into the tube, the grenade could reach a distance of 250 meters.

The most effective use of the T28 was to attack the enemy which was behind cover which could not be reached by any other means. The angle of launch was to be adjusted to achieve an air burst about two meters above the ground, which would create a 10 meter diameter kill zone with more than 600 fragments. The grenade didn't have enough explosive charge to be effective against enemy permanent bunkers.



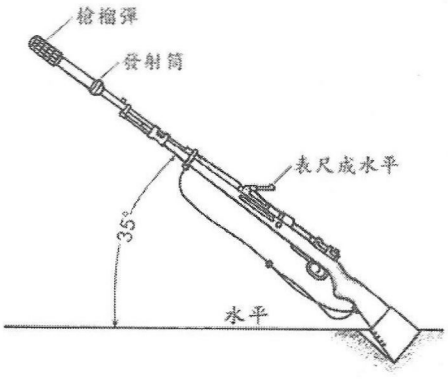
Picture 515 The T28 could be fired in either a kneeling or prone position. The angle of inclination could be 10 degrees to 70 degrees.

The grenade could also be used as a hand grenade. There was a thin copper wire in the neck section which had to be taken out first, and then the bottom of the wood handle had to be struck on a hard surface to ignite the fuse. Once the fuse was ignited, the sound of ignition should be audible. Then count to three and then throw the grenade towards the target. The delay was six and one-half seconds. It was more powerful than a regular hand grenade, but the usage guidelines were the same as for the other defensive hand grenades.

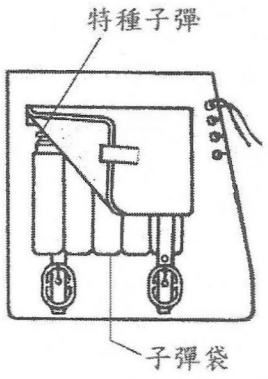


Picture 516 The T28 barrel connector and carrying snap. Source F.

Picture 517 View of the postwar model connector. It added a front sight securing protector and another layer of copper shim for use with US 1903 rifles –one shim was removed for use with the Zhong Zheng Shi rifle and both shims were removed for use with the Hanyang rifle. Source F.



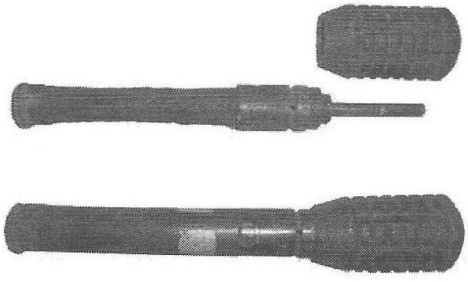
Picture 518 An illustration of the proper positioning to fire a T28 grenade launcher. The rifle must be securely placed against the ground with the leather stock protector attached to the buttstock.



Picture 519 The leather stock protector also doubled as a cartridges carrier with five rounds of special purpose cartridges.

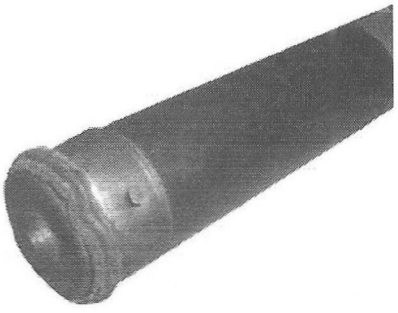
During the war the monthly production was 80,000 grenades and 2,000 launcher s

After the war, the 80th Arsenal started series production of T28s. It actually conducted a test to fire the grenade with regular cartridges. The result showed that it might damage the launcher, resulting in early detonation and shortened range of the grenade but there was no harm done to the rifle or firer.



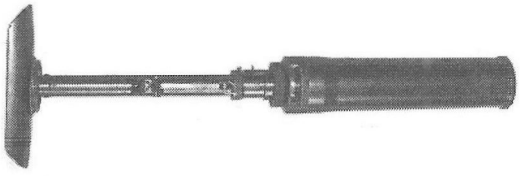
Picture 520 A sample of the high explosive T28 grenade. James Bogdan collection.

Picture 521 A close up of the war head. Note the marking on the wood handle. James Bogdan collection.



Picture 522 The end of the wood handle has felt secured on it so it would stay in any position inside the launcher. James Bogdan collection.

III. Japanese Type 10 Grenade Discharger



The Type 10 Grenade Discharger
Specifications
Operation Method：Gas propel
O/A Length：525mm
Tube Length：240mm
Caliber：50mm
Weight：2.70kg
Feed：Single shot

Picture 523 Japanese military personnel are examining captured Chinese weapons after the Japanese took control of Beijing in 1937, There are large numbers of grenade dischargers. The design was different from that of the Japanese pattern. These were probably produced either by the Shangxi Arsenal or by the 29th Route Army Weapon Depot. Source A.

Many Chinese grenade dischargers were somewhat patterned after the Japanese design. The Type 10 used the regular infantry hand grenade with a booster section.

Picture 524 Japanese Type 91 hand grenade with the booster attached for use with Type 10 grenade discharger. Courtesy of Mark Strange.

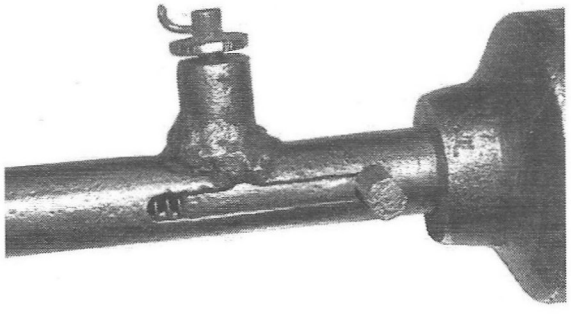
Picture 525 Type 91 grenade with booster section detached. Courtesy of Mark Strange.

In 1934, Hanyang Arsenal produced a small number of Japanese Type 10 pattern dischargers.

The 29th Route Army was the Beijing garrison troops and they were equipped with large numbers of grenade dischargers, which were either made by their own Weapons Depot or Shanxi Arsenal.

The Communist arsenals behind enemy lines also produced small numbers of grenade dischargers and grenades.

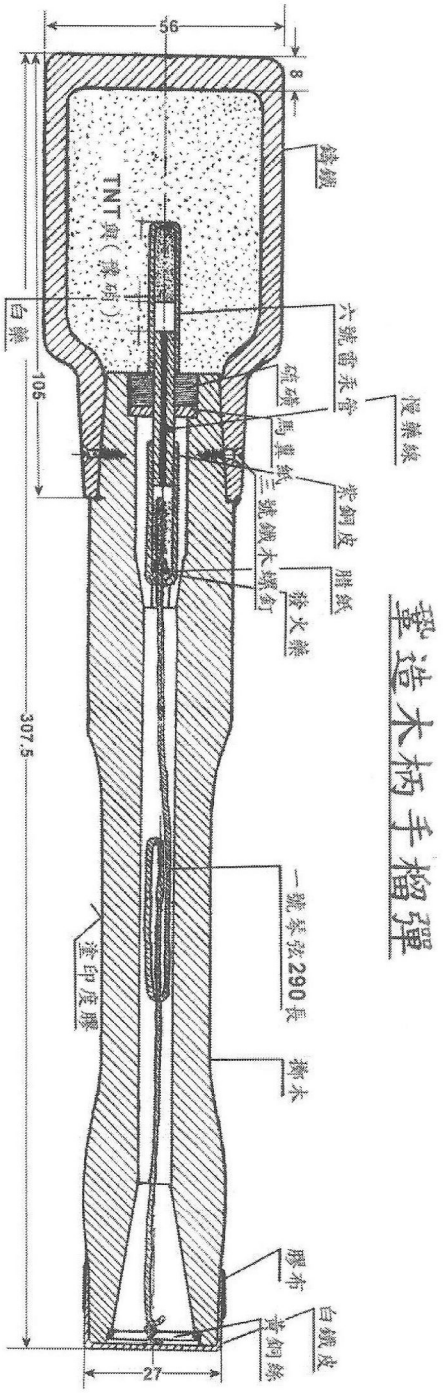
Picture 526 A grenade discharger believed to have been made behind enemy lines. Courtesy of collector Wan Wan, Hebei.



Picture 527 The trigger portion of the above discharger. It appears to have a sear and by pulling the ring (partially missing the firing pin is released.

Section 7. Hand Grenades

I. Shangdong, Gongxian, Jinglin, Shanxi, Hemp-Tail, Russian Pattern and Italian Pattern Grenades



Picture 528 The restored section view drawing from a Gongxian Arsenal original document.

Wood Handle Hand Grenade Specifications
O/A Length： 150mm~310mm
Weight：0.6kg~0.8kg
Wood Handle Length：80mm~240mm
Diameter：42mm~62mm
Charge：50g~120g

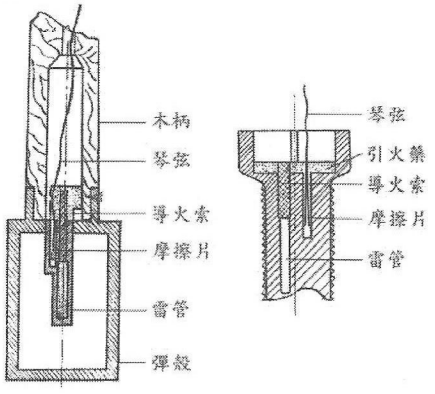
Wood handled grenades were the primary grenades used during the war by Chinese troops. This was a very simple design and the materials required to produce it were readily available. The production rate was fairly high compared to other ordnance. The primary producers were the 1st, 11th, 21st, 24th, 25th and 30th Arsenals, and hundreds of thousands of grenades were produced each month. During the war, Chinese troops favored close combat due to the lack of firepower. The hand grenade was a very effective weapon in these situations. During a defense situation, grenades thrown down on climbing enemy troops was also especially effective.

There were variations in design but most followed the same basic principles. It had a slow burning fuse, wood handle, and either a round, bottle or cylinder shaped main body. The 11th Arsenal pattern was the most representative of all. It was a copy of the German M1924 pattern. The outer dimension was the same but the body was made of cast iron. (See below "Instructions for Gongxian Hand Grenade.") The charge was a mixture of TNT and nitride potassium, which resulted in weaker exploding power. The Shanxi and Jinglin hand grenades were different in size and shape but still followed the same basic design. This was the primary type of hand grenade issued during the war.

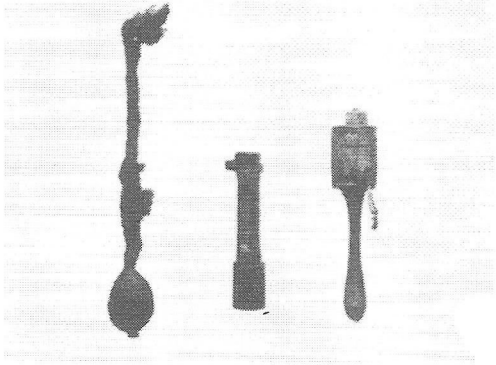
In 1939, trials began for a smaller hand grenade design. The wood handle was shortened to 8 cm, the body was changed to a cylinder shape and the outside diameter was reduced from 5.6cm to 4.2cm. The charge was changed to a compressed load to increase the explosive density. The new hand grenade was lighter but more powerful. Due to the reduction in weight, it could be thrown further. This design was decreed by the

Ordnance Office as standard to all the arsenals.

The Shandong type grenade was produced by the Jinan Arsenal. It was modified from a handle less design and a wood handle was attached. Its ignition mechanism was similar to striking a match. After the Jinan Arsenal relocated to Chungking, the humid weather often affected the reliability of the grenade so production was changed to the Gongxian pattern.

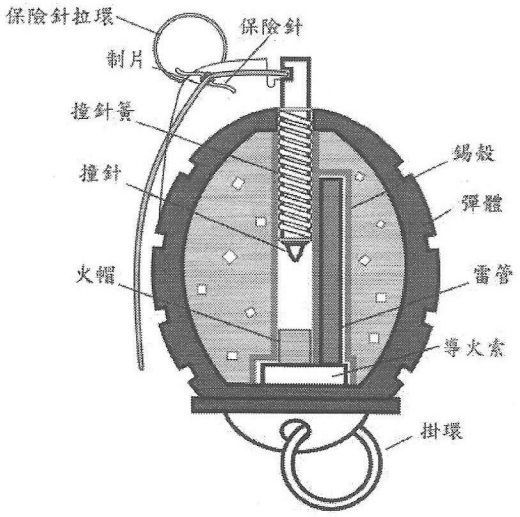


Picture 529 The Jinan type hand grenade illustrated. The pull wire would slide a friction piece to ignite the fuse.[77]



Picture 530 Three different kinds of hand grenades captured by the Japanese in Manchuria. From left: hemp-tail grenade, wooden handle hand grenade and some kind of large attack hand grenade. Post card issued by Yushkan, Tokyo, Japan.

There were also handle less hand grenades in production. These mainly utilized a spring and hammer to strike a primer to ignite the slow burning fuse. The 2nd Naning Machine Shops in Guangxi could produce 800 a day based on the Italian pattern. The Russian pattern impact grenade was also produced by Taiyuan and Hankow Arsenals, although production ceased due to technical difficulties Reference 29 mentions a "Russian Type" hand grenade but this is actually the British Mills grenade.

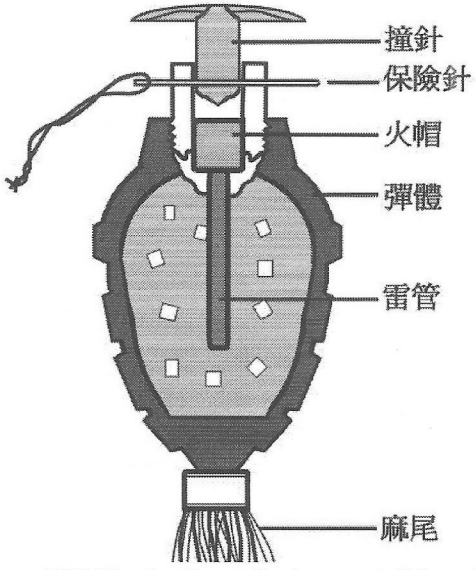


Picture 531 The British hand grenade designed by William Mills in 1916. Although there were modifications to the design, it was in use from WWI to the 1970s in British and other Commonwealth armies. It's called a "Russian Type" by the Chinese for some reason.

The primer and fuse were stored separately for Mills grenades during transportation, so these needed to be installed before use. To throw the grenade, the grenade is held in the right hand, pressing down the safety lever, and the safety ring is pulled with the left hand before throwing the grenade at the target. The safety lever flew away during flight and a striker would ignite the fuse. This type of grenade was very powerful but it could be thrown to only about 2/3 of the distance of the other types due to its weight. Based on hand grenade production descriptions, the Hanyang Arsenal apparently produced this type of grenade.

[77] Reference 32.

Jinling Arsenal produced a hemp-tail grenade. This was basically a grenade utilizing a spring and hammer ignition system but a long hemp fabric rope was fastened to the end. The rope aided in the throwing of the grenade. It also looked like a ponytail so it was nicknamed the "Pony Tail Grenade." This type of hand grenade didn't have a slow burning fuse but detonated on impact. In general, this type of grenade could be thrown a longer distance due to the acceleration through centrifugal force.



Picture 532 Illustration of a hemp-tail hand grenade.

The Chinese troops often bundled the grenades together to increase their destruction power, These were called "Bundled Grenades" (集束手榴彈) and were used against hard targets such as pillboxes, armored vehicles and tanks. As long as one of them went off, the rest would go off as well and create devastating effects. Due to the increased weight, it was not practical to throw the bundle. A soldier had to deliver the bundle and if there wasn't enough time to get away, the soldier most likely would perish with it.

Another tactic Chinese troops often used was to tie one or more grenades to the end of a long bamboo stick. For example, the defenders on city wall could stick it out in the air to generate an air burst with very effective results. Another way of using this type of configuration was to stick it into the window of an enemy occupied building. Because of the long stick, the enemy couldn't kick the grenade away or throw the grenade back.

In addition to the primary arsenals, the Communist guerrilla workshops put great emphasis on hand grenade production as well. When there was no high explosive available, black powder would be used as a substitute. It could also cause severe injury to the enemy. The hand grenade, the landmine, and reloaded ammunition were the three most important products of the Communist Ordnance industry during the war.

From the production perspective, when the grenade or landmine didn't have to conform to various weather condition and transportation requirements, they became fairly easy to manufacture. The guerillas were not supposed to get into a lengthy fight with the enemy; their tactics were more of setting up ambushes and surprise attacks. Hand grenades and landmines were very convenient for these tactics. They could cause very severe injuries, easily blow off a limb, really affecting the enemy's morale.

Attached: The Instruction Sheet for Gongxian Wooden Handle Hand Grenade

The hand grenade produced by this arsenal is very simple and safe. Here is the explanation of the functioning principles and notes on its operation.

One. The Structure

The wood handle is a long hollow stick with a pull string inside it. On the end of the wood handle, there is a copper ring attached to the string. The ring usually rests in a recess at the end of the handle. For safety, it is encapsulated by a cap. At the other end of

the string, there is a copper tube, hard paper bushing and fulminate percussion cap. The end of the string is covered with glass particles and the copper tube contains the slow burning fuse. On the other end of the fuse is the blasting cap. When these were installed, melted sulfur was poured around the paper bushing to seal it. The whole assembly is inserted into the cast iron body with explosive installed and secured on the side by screws.

Two. Operation

When the grenade is to be used, grasp the handle with the right hand, and tear off the seal tape around the cap with the left hand. Carefully take out the pull string with the copper ring, place the ring on the little finger of the right hand and throw the grenade to the target as hard as possible. Take cover immediately after the grenade is thrown.

Three. Detonating Mechanism

When the grenade is thrown, the pull string ring is held by the finger so it will pull the string through the fulminate cap and cause it to ignite. The fuse starts to burn due to this ignition and after 4-5 seconds it would reach the blasting cap and detonate the explosive.

Four. Notices

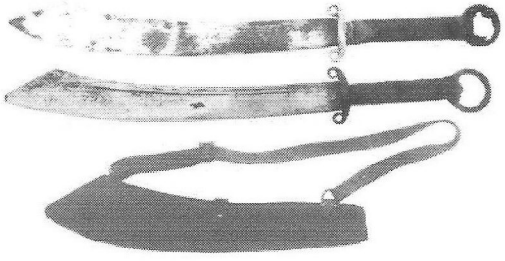
1. To prevent humidity, the wood handle and the body of the grenade are all coated and sealed with wax. After it is taken out of its original container, the user should pay attention to avoid rain or dampness.
2. As indicated above, put the ring around the right hand finger. The purpose is to ignite the fuse while throwing at the same time. Do not pull the ring with the left hand and throw the grenade with the right hand, as any delay could cause the grenade to explode in the operator's vicinity.
3. After the ring is taken out of the handle, only pull it as far as it can reach on the finger. Do not pull it too much to prevent accidental ignition.
4. Do not take off the cover unless it is to be used immediately. When a grenade is not used after the cover is taken off, carefully replace the pull string, ring and cover before putting the grenade back into the carrying bag.
5. Even though the design is very safe to carry, please do not handle it roughly to prevent the blasting cap from accidentally igniting or breaking the sulfur seal as this could result in burning leakage of the fuse and an early ignition.

Picture 533 A picture of front line troops in Shanghai, 1937. The hand grenades in the chest pouches can be clearly seen. Note the black sealing tape around the cap. Lian You #132.

Picture 534 Concurrent 1:1 Gong grenade and hanger replica for reenactment purpose.

Section 8. Broad Swords and Bayonets

I. Broad Swords



"Gunshot bangs were loud; shoot the Japanese crying moms and dads, sword was sharp and quick, chop off the Japanese heads"

Popular song during the war, Cleaning the Gun

The broad sword was a traditional Chinese weapon. It was easy to make and the materials to make it were available everywhere. It was a very common supplemental weapon during the war. In some older organizations, broad swords were part of the standard equipment and soldiers trained with them on a regular basis. For the newer and better-equipped troops, with increased firepower, broad swords were not as important.

The commonly seen broad sword is called "Guitou Dao" (鬼頭刀). It has a thick body with a broad point. It was used with both hands to increase the striking force. Most of these were constructed in a similar fashion. After the body and handle were forged, a cross guard was fitted. Two semi-circular wood pieces would be put on the handle and wrapped with either cloth or leather. Usually there was a large ring soldered on the end of the handle, to which most of the time was attached a piece of red cloth. This was an old tradition whose purpose was to confuse opponents during a sword fight.

The famous song during the war "Broad Sword Marching" was composed to commemorate the victory over Japanese troops in the "Great Wall Campaign" and the new conflict in Beijing. It was very stimulating and a morale booster. However, it was just that. The broad sword might be very effective during close combat, but for facing air planes and artillery bombardment it was useless.

Picture 535 A period cigarette card depicting a Chinese trooper slaying a Japanese soldier.

The most effective usage of the broad sword was in a night assault. Under the disguise of the night, it was difficult to distinguish the enemy from our own, so the more powerful weapons became useless. The broad swords became the most effective weapons compared to the bayonet or the Japanese Samurai sword. However, this was easier said than done, since most of the time the Chinese

troops didn't even know where the enemy was, let alone attack their positions at night.

In a defensive situation, the usefulness of the broad sword was also very limited. The Japanese typically would barrage defense lines with aerial attacks or artillery shelling. Some commanders knew enough to build a second line and wait until the bombardment ceased before entering the front line to face the approaching enemy. However, most of the time it was like the old saying "Qin had the big bat and Song had the forehead" (金有狼牙棒、宋有天靈蓋), after a period of shelling, there were not many left to fight.

Picture 536 Another period cigarette card depicting Chinese troops practicing with the broad sword.

For the various guerrilla troops behind enemy lines, there were not enough weapons to go around. A broad sword obviously could be considered a weapon.

Attached：“Broad Sword Marching”

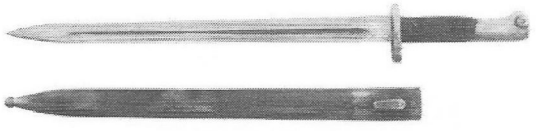
Written and composed by Sun Peiyuan (孫培元) (Also known as Mai Xin 麥新) in July 1937. It was subtitled: "To the Broad Sword Braves of the 29th Route Army."

Broad swords swing against Japanese heads
Braves of the 29th Route Army (Later changed to: All armed brothers everywhere)
The time has come to resist the enemy (Later changed to: The victorious day is coming)
There are Northeastern Volunteer Troops leading (The Communists changed it to: There is Communist 8th Route Army leading, Nationalist Government changed it to: There are Central Army braves leading)
All the people are behind us
Our 29th Route Army is not alone (Later changed to: Our troops bravely march)
Aim at the enemy
Destroy them, destroy them
Move forwards
Broad swords swing against Japanese heads

II. Bayonets

Zhong Zheng Shi Bayonet Specifications
O/A Length：575.5mm
Blade Length：484.5mm
Weight：0.75kg

Belgium Export 1924 Bayonet Specifications
O/A Length：515.mm
Blade Length：385mm
Weight：0.55kg



Picture 537 A Belgium export 1924 Bayonet.

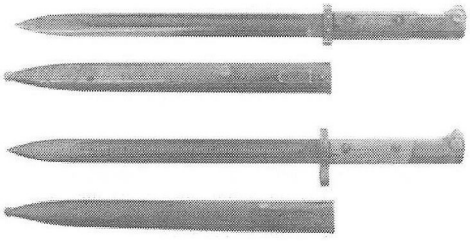
Hanyang Bayonet Specifications
O/A Length：517.5.5mm
Blade Length：395.5mm
Weight：0.566kg

"In the complete darkness, the soldiers in the trenches extended their hands out to feel the fabric of others. The rough cotton materials would be our own, while the smooth cotton clothing would be the enemy's. Once an enemy was discovered, they would bayonet him immediately. The night was filled with rifles clashing, men

screaming when bayoneted, and complete silence in between...."

The Hengyang Defense, Bai Tianlin (白天霖)

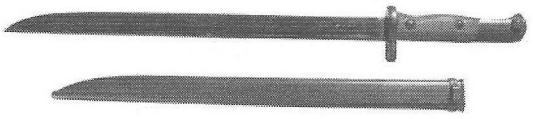
A bayonet is much more complicated in construction than the broad sword. It consisted of machined parts such as the spring, lug, sheath, etc. This was not something could be fabricated everywhere in China at the time. Bayonet production could never keep up with the rifle production and there were shortages in the Chinese troops.



Picture 538 Two variants of the VZ-24 bayonet. The Chinese used the one shown below.

Prior to the war, China purchased a fair number of Belgian export 1924 bayonets. These were quite common among Chinese troops.

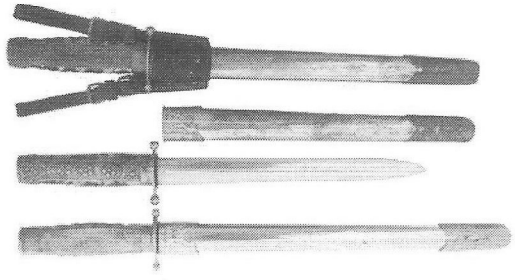
There were basically three different types of domestically produced bayonets. The first one was the Zhong Zheng Shi bayonet; in which the blade was similar to the British 1907 pattern. The early version was equipped with a metal sheath, but later the 21st Arsenal produced a leather scabbard. The other types were bayonets for Hanyang rifle, a long and a short type. The long type had a blade similar to that of the Japanese T30 bayonet and the short type was the typical Mauser pattern. The Zhong Zheng Shi and Hanyang bayonets were not interchangeable. After the war, many Japanese surrendered bayonets were converted to either Hanyang or Zhong Zheng Shi bayonets. These have the Type 30 pattern blade but they are a post-war product.



Picture 539 A Zhong Zheng Shi bayonet with a Japanese T30 blade and scabbard.

In addition to the formal arsenal production, the various workshops and repair depots also produced bayonets. They were in a great variety of patterns as well as quality but all contributed to the war effort.

III. Dress Daggers



The Chinese dagger was a short sword that officers wore with their dress uniform. It was also called the "Zhong Zheng Dagger" (中正劍), "Soldier's Soul" (軍人魂). It actually was not a weapon but a uniform accessory. Some were souvenirs from various training conferences, local military commanders, etc. There were also personally purchased items. The government actually had clear specifications for the dagger:

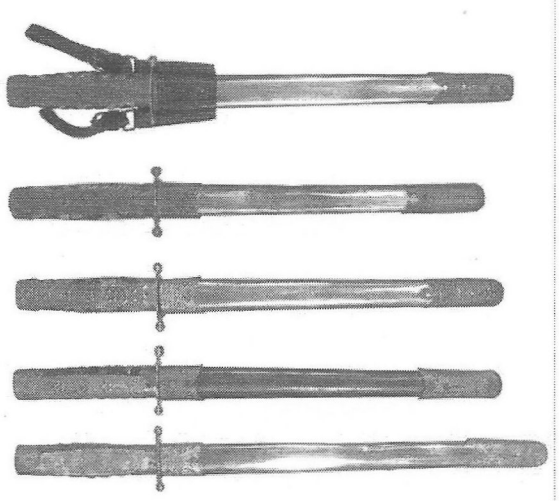
"1. Army, Navy and Air Force personnel must wear the short dagger with the dress uniform.
2. The short dagger must be purchased by the individual and is not issued by any government agency, except for the ones given by the head of the Military Committee.
3. The top five student graduates from the Military Academy could apply for short daggers from the Military Committee.
....."

7. The shops that produce these short daggers must be appointed by the Military Affairs Ministry and registered. Non-registered merchants must not produce the short sword."[78]

The pattern was also specified: [79]
"Overall length 39 cm, handle 11.2 cm, hand guard 3 mm thick, sheath 27.5 cm long, handle width 3 cm, sheath opening 3cm long, and end width 2.2 cm. The handle should be made of the shell of the hawk's bill turtle, the side and top of the handle should be covered with brass and gold plated with a plum floral pattern. The hawk's bill turtle material should be wrapped with crossed golden threads. The hand guard should also be made of brass and gold plated. The sheath should be white and nickel plated, the opening and the end should be covered with brass; the opening covered by 3.2 cm brass, the end covered by 6 cm brass. The blade should be 26 cm long, and there should be a spring lock between the handle and the sheath."

The short dagger was worn on the Sam Browne belt on the left side. It should not extend below the knee or above the waist.

Even though the specifications were pretty clear, these were actually produced by anyone who was capable and tremendous variety existed. It was actually hard to find a "standard" one made to the official specifications.

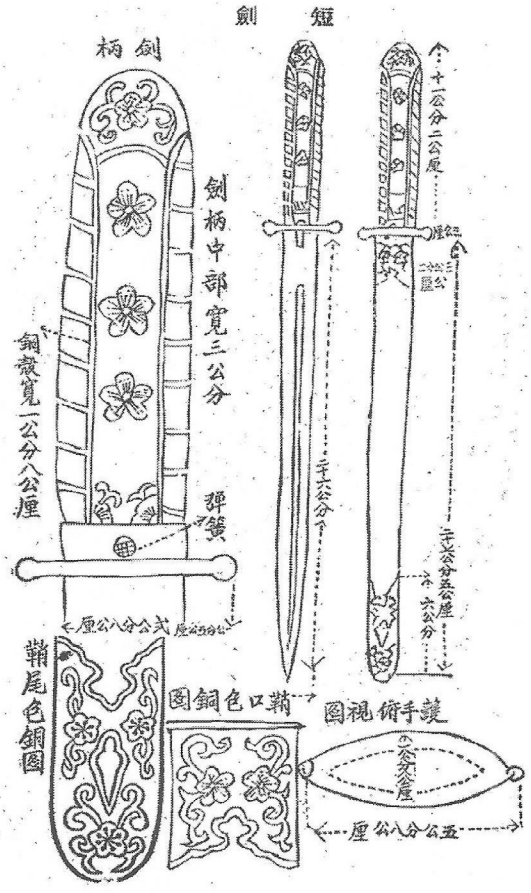


Picture 540 Five different kinds of dress daggers.

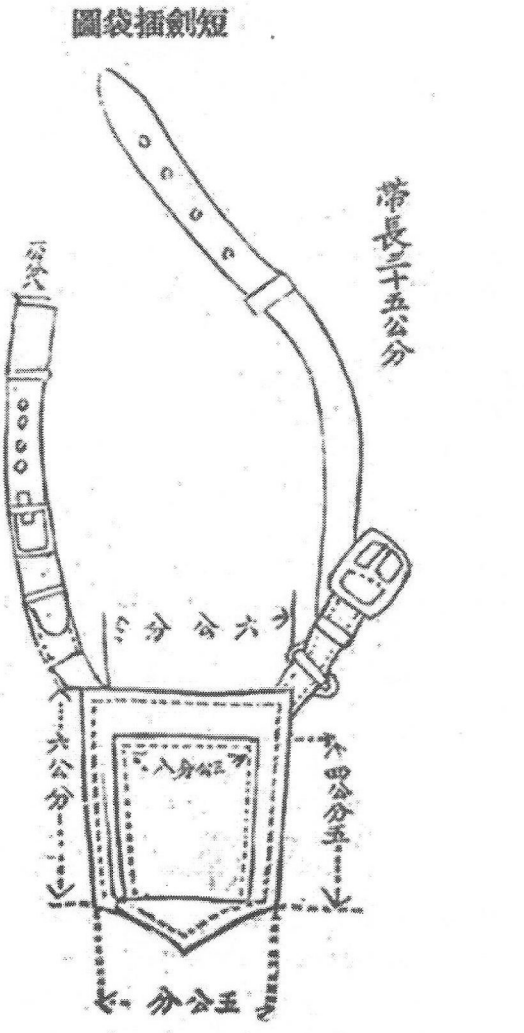
Picture 541 A short dagger worn with the dress uniform. Combined Logistics Command photo.

[78] The Nationalist Government Military Committee Orders, (國民政府軍事委員會訓令) Gong 2 (Master) #135, General Staff HQ, (公二(總)第一三五號令參謀本部), January 14, 1937.

[79] Nationalist Government Publication, Rule & Regulation 12, # 1950.



Picture 542 Dagger design illustrated in the "Type 24th Year Uniform Standards".
(二十四年服制條例)



Picture 543 Dagger hanger design illustrated in the "Type 24th Year Uniform Standards".
(二十四年服制條例)

The Short dagger was just a decorative accessory for the dress uniform. It really served no other specific purpose. Some referred to it as the “suicide sword,” implying that it was used to end the soldier’s life when he was faced with defeat. This might sound very romantic but it was not a tradition the Chinese soldier believed in. Besides, there were plenty of other weapons to choose from should a soldier decide to take his own life; a dull short dagger would be a pretty painfully way to die.

Picture 544 Welcome, Chen Yanqiao (陳煙橋), from Wood Print Selections of the 8 Year War of Resistance, first printing, Kai Ming Bookstore, December, 1946.Picture 545 Welcome, Chen Yanqiao (陳煙橋), from Wood Print Selections of the 8 Year War of Resistance, first printing, Kai Ming Bookstore, December, 1946.

Chapter 8. Japanese Small Arms

Section 1. Introduction to Japanese Army Organization

Japan had a compulsory educational system in place since the Meiji Restoration. The general public was more or less educated to a certain level. Unfortunately, better education didn't make them more civilized as witnessed by the atrocities Japanese soldiers committed in China during the war.

Due to the proliferation of education, the Japanese military had a good pool of people to draft from for their armed forces. China, on the other hand, had new recruits that needed to be educated to be modern citizens before they could be trained to be soldiers.

During WWII, a small island nation like Japan could invade the Asian mainland, the South Pacific and many other places. This ability really should be credited to the success of its educational system.

The organization of the Japanese Army Division went through several adjustments during the war. There were also special mission dictated organizations and independent brigades. We'll only discuss basic division organizations here based on the "Handbook of Japanese Military Forces" published by the US War Deptment. A division usually consisted of twenty to twenty-five thousound men, 9,000 rifles, 382 light machine guns, 112 heavy machine guns and special services units such as artillery, medical, engineering corps, etc. It's capable of being a tactical combat unit.

The basic combat element was the infantry squad, which consisted of 13 men. In addition to rifles, it was also equipped with a light machine gun. A platoon consisted of four squads, one of which was a grenade discharger squad with two to three grenade dischargers.

A company consisted of three platoons. Companies in the reinforced division were equipped with two heavy machine guns and two 20mm cannons.

In comparison with the Chinese organization, equipment for the individual infantry man didn't have a big difference but the gap became wider starting at the company level.

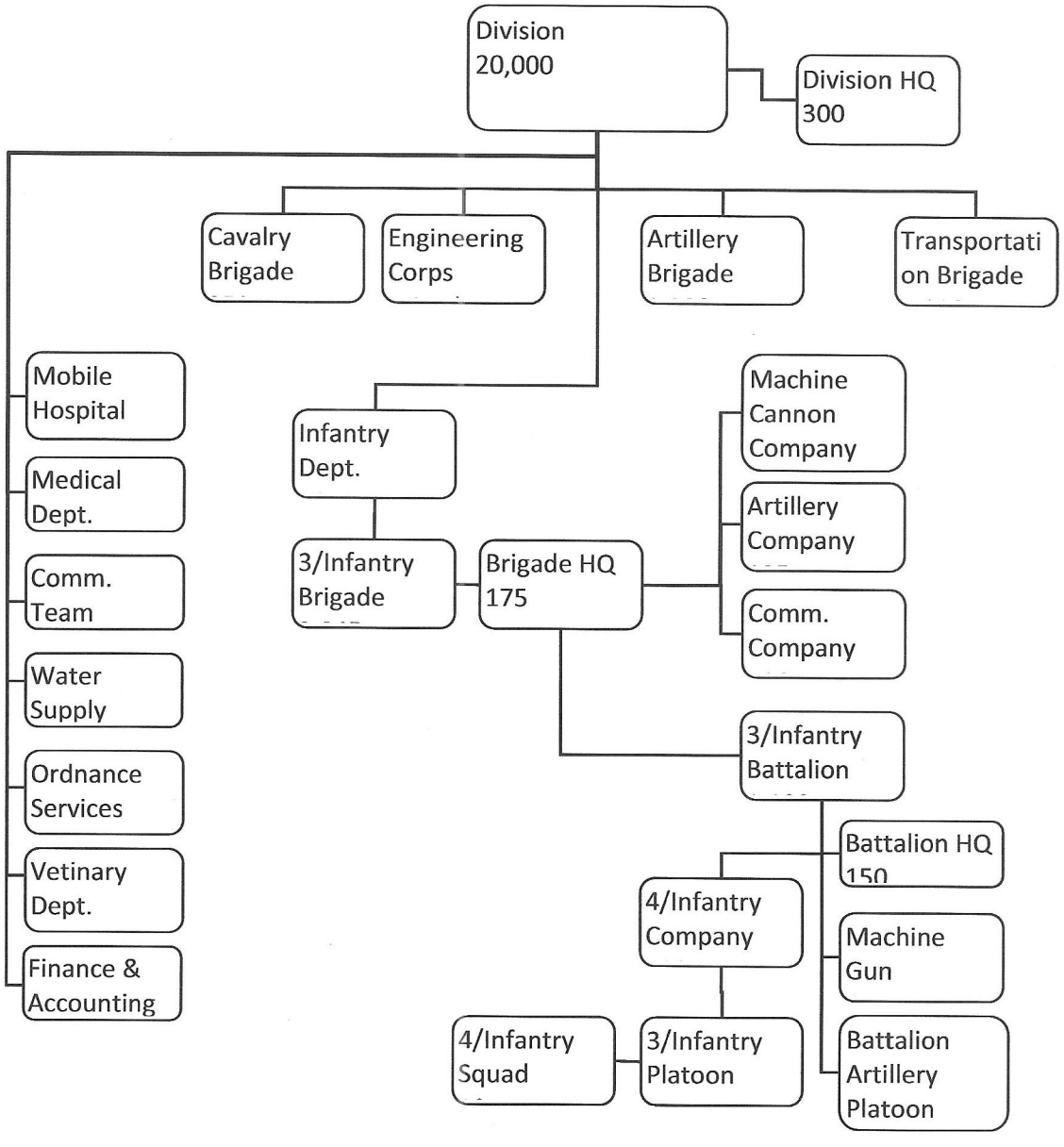
Compared to the Chinese troops, Japanese forces had much greater fire power. However, it was still inferior compared to the armies of Western powers. Regardless, Japanese troops smashed through most of the Western colonies in Asia at the beginning of the war. It probably was due to their determination and the element of surprise. The performance of those Western powers troops was not even as good as that of the beaten Chinese troops.

Towards the end of the war, Britain and the US pretty much resolved the situation in Europe and could turn their attention to Asia. The Japanese were in trouble. After years of exhaustion of manpower and resources, the Japanese military was greatly weakened. Japanese's idea of holding occupied territory to the death was also detrimental to its strength. Japan never thought about contracting and holding a reasonable line against the Allies but defended each position to the death. The men and resources lost could never be recovered.

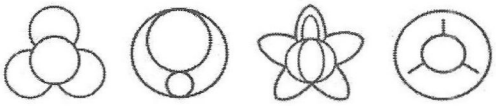
In the China Theater, China had been struggling to hold on and was almost at its limit. However, as the Japanese grew weaker, Chinese troops were growing stronger due to the resources that had started pouring in from the Stilwell Road.

The Burma Campaign in 1944 showed that Japanese forces were at their last ditch.

Chinese troops advanced both from China and India, eliminating Japanese combat forces along the way. In China, Japanese forces also voluntarily abandoned some occupied areas and contracted their lines in 1945. This showed that as long as Chinese troops were reasonably trained supplied; they could fight the Japanese anytime, anywhere. Into the late 1930s, China was pushed to war before it was ready. If China could have gained another two to three years to complete the steel refineries, the artillery factories, the car factories, etc., many people wouldn't have perished in the war and the progress of the war may have been totally different.

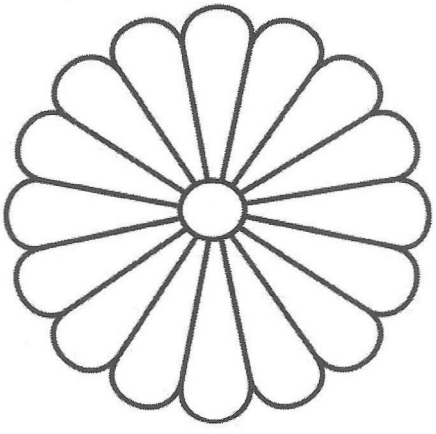


Japanese small arms were produced mainly in four arsenals: Kokura Arsenal (originally Koishikawa Arsenal in Tokyo, relocated and renamed after the Great Kanto earthquake), Nagoya Arsenal, Jinsen Arsenal (Korea) and Hoten Arsenal (Manchuria).



Picture 546 Arsenal marks of Japanese arsenals, starting from left: Kokura, Nagoya, Jinsen and Hoten.

The various Japanese expeditionary forces had their own repair depots and they also produced a certain number of small arms. For example, the "North China Expedition Forces" had the North China Arsenal and it produced the North China series pistols and rifles. The "Central China Expedition Forces" also set up facilities in the original Jinling Arsenal location to repair guns, rifles, radio and perform other tasks.

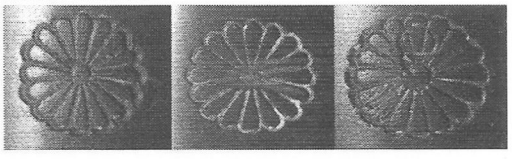


Picture 547 The Japanese Emperor's 16 petaled chrysanthemum symbol.

Kijiro Nambu was a very prolific Japanese small arms inventor and designer. He was involved in most of the design of the small arms in use during the war. It was Nariakira Arisaka who led a team to design the Type 30 rifle but it was Nambu who improved it to become the Type 38. Nambu also designed several pistols, machine guns and machine cannons which were adopted by the Japanese military.

The purpose of this chapter is not to provide a comprehensive coverage of Japanese small arms, but rather to offer an introduction to Japanese small arms used in the China Theater during the war.

Most of the Japanese small arms were imprinted with the Emperor's "kamon" (family marking), the chrysanthemum or simply mum. When the arm was transferred to a school or other civilian organization, the mum had to be cancelled to show that it was no longer in the Emperor's service. Upon Japan's surrender at the end of war, the army department ordered all units to deface the mum before turning them over to Allies. It appears that Japanese also requested General McArthur to help to carry out this order. For this reason, most of surrendered rifles had different levels of marks struck on the mum. Those small arms captured in the battlefield obviously would still have the mum intact.

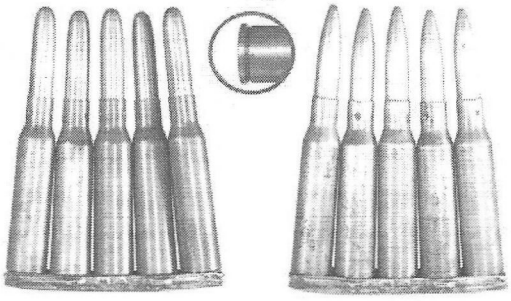


Picture 548 The mum on the left is untouched, the middle one is lightly struck and the right most one has a stamped circle to cancel the mum.

The serial numbers on Japanese rifles were originally only numbers. In 1933, a kana character in a circle was added in front of the 5-digit serial number. Different kana characters were issued to different arsenals. Collectors like to refer to the different kana and serial number combination as "series."

Section 2. Cartridges

I. 6.5x50mmSR



Picture 549 The 6.5x50mmSR cartridge and clip. Left: early round nose cartridges for Type 30 rifles. Right: the spitzer type cartridges for Type 38 rifles. Insert: the close up of the semi-rimmed base of the 6.5mm cartridge.

Caliber：6.5 mm
Shell Length：50 mm
Bullet Weight：139 gr/9 g
Muzzle Velocity：762 m/s

The Japanese 6.5mm cartridge was developed along with the Meiji Type 30 rifle in 1897. It was in Japanese service throughout the war. One of the design goals was to have strong penetration to defeat targets behind cover. However, over penetration and reduced stopping power became major issues similar to that of the 7.63x25mm cartridge.

China was quite familiar with this cartridge. Various units had been using Japanese small arms since the late Qing period. After a long debate, China went with the slower but more powerful 7.92x57mm cartridge.

The 6.5mm cartridge was a semi-rimmed cartridge. That meant that the rim size was between rimmed and rimless. The benefit was to offer easier extraction.

Some sources state that the Japanese military discovered that the standard 6.5mm round resulted in excess wear and tear in the Type 11 light machine gun. Therefore, the Japanese military distributed a reduced load for light machine guns use. In fact, the statement is incorrect. American troops did capture some cartridges during the later stage of the war with a lesser powder charge. However, this was a result of adopting a double-based smokeless powder which no longer needed as much powder as before.

The Type 38 and its 6.5mm round were the focus of a lot of Chinese popular literature. The combination was hailed as the best sniper weapon. In fact, the 6.5mm round did have a higher muzzle velocity but the accuracy was no better than other military rounds. The terminal ballistic performance was actually not as good. On the Pacific Islands, due to the low noise and basically no muzzle flash, it was difficult to locate where the shooter was. However, leaves, branches or any other small obstacle in the jungle would often deflect the 6.5mm bullets.

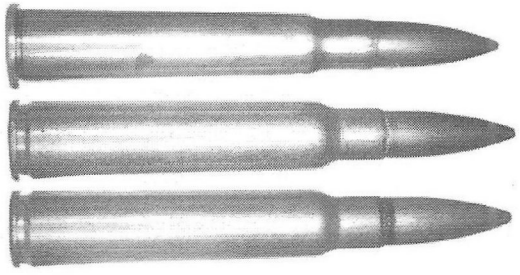
The Type 38's rear sight was calibrated to 2,400 meters but that didn't mean the rifle could be used against targets that far away. In fact, anything over 1,000 meters would be very difficult for normal naked eyes to see. The situation is similar to the 1,000 meters rear sight calibration on the C96s.

These long range settings were actually used for an old infantry tactic called "volley fire" before machine guns and mortars were popular. A complete infantry unit would fire in unison in the same direction beyond sight, under an officer's order and guidance, in hopes that that the falling bullets would kill the approaching enemy. The tactics became obsolete after machine guns and mortars were widely deployed.

The greatest benefit of 6.5mm was actually its small recoil. This made it easier for new recruit to handle and didn't cause a lot of fear because of recoil. In return, their shooting accuracy would be much better.

The 6.5mm rifles had a very distinct report. A crisp sound followed by the crack of the sonic boom. It's unlike the heavy boom of the 7.92mm rifle. The Chinese rarely used captured Japanese rifles for this reason. They didn't want friendly troops to misunderstand where the enemy was.

II. 7.7x58mm



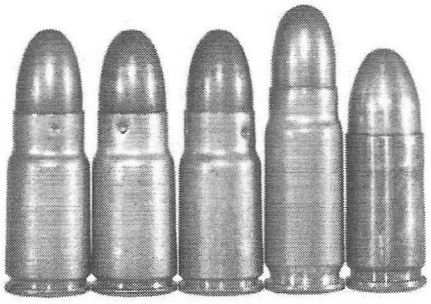
Picture 550 7.7mm cartridge comparisons. Top: British 7.7x56mmR, middle: Japanese 7.7x58mmSR for Type 92 machine gun and bottom, the 7.7x58mm cartridge.

Caliber：7.7 mm
Shell Length：58 mm
Bullet Weight：175 gr/11.34 g
Muzzle Velocity：732 m/s

Picture 551 7.7x58mm cartridges and clip. The right most round was the steel cased 7.7mm round produced towards the end of war due to the shortage of copper.

The three types of 7.7mm cartridges were produced concurrently during the war. The British round was used in the Navy Lewis pattern machine guns on aircraft. The semi-rimmed version was used in the army's Type 92 machine guns. And finally, the rimless 7.7mm was used in the Type 99 rifles and Type 99 light machine guns. These cartridges were not interchangeable. This was probably the only example in the world of modern armed forces producing three different types of cartridges in the same caliber.

III. 8x22mm

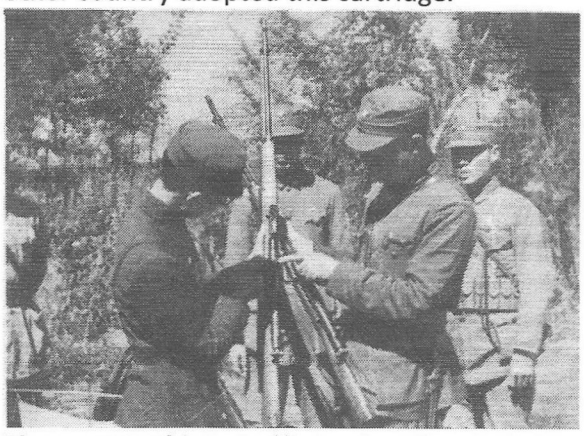


Picture 552 Japanese 8mm pistol cartridges compared to other pistol cartridges of the same period. The left three are Japanese 8x22mm, the fourth one is a 7.63x25mm Mauser cartridge and a 9x19mm Parabellum cartridge on the far right. All 8mm pistol cartridges had the crimp dimples on the neck of the cartridge case which was unique to Japanese cartridges.

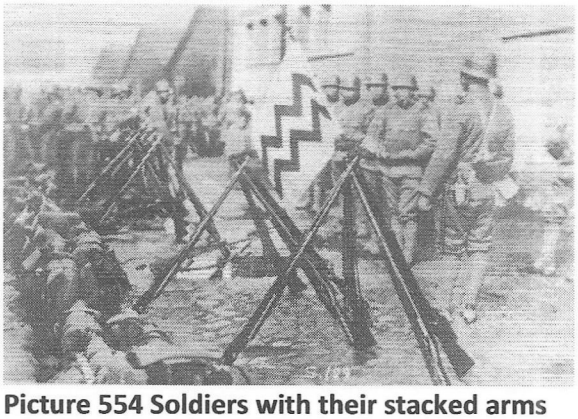
Caliber：8 mm
Shell Length：22 mm
Bullet Weight：103 gr/6.67 g
Muzzle Velocity：325 m/s

The Nambu 8mm pistol cartridge was developed along with the first model Nambu pistol in 1904. It was the standard pistol cartridge for Japanese forces throughout the war.

The power of 8mm cartridge was on par with the 32ACP and was inferior in every way. No other country adopted this cartridge.



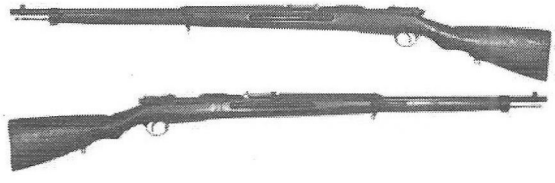
Picture 553 Chinese officers examine captured Japanese Type 38 rifles. Courtesy of Fukuo Association.



Picture 554 Soldiers with their stacked arms at a rest point. Japanese military photo.

Section 3. Rifles

I. Type 30 Infantry Rifle



Type 30 Infantry Rifle Specifications
Operation Method: Manual Turn Bolt
O/A Length：1,280mm
Barrel Length：800mm
Caliber：6.5x50mmSR
Weight：3.95kg
Muzzle Velocity：765m/s
Feed：5-shot internal magazine

At the end of 19th century after defeating China in the first Sino-Japanese war, Japan had become the de facto regional power in Eastern Asia.

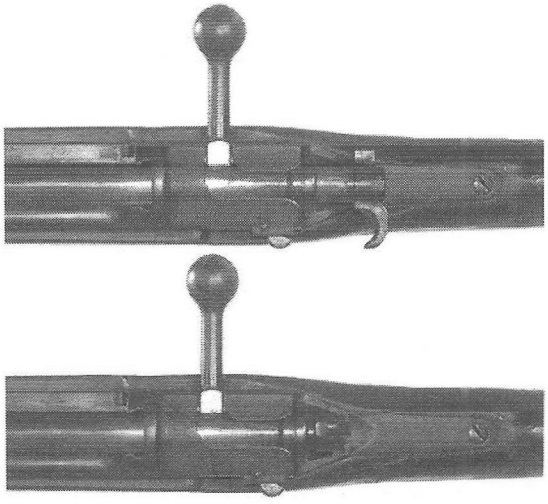
The world powers rushed to adopt smokeless powder and smaller caliber repeating rifles in the 1890s. Japan was no exception. Colonel Nariakira Arisaka of the Koishikawa Arsenal was given the task of designing a new rifle to replace the aging Murata rifles in July, 1896.

The team Arisaka led took only four months to complete the design. They took features from Mauser rifles and added some indigenous designs. The result was a very up to date repeating rifle. (The Hanyang rifle went into production at about the same time; both rifles are in the same class). Also, the Type 30 set the foundation for the next 50 years of Japanese rifle design.

The Type 30 had a rear bolt handle, double front lugs, and clip loading – all Mauser features developed after the M1888. The bolt was an indigenous design with a separate bolt head and bolt body, which proved to be much weaker and inferior to the Mauser design and was abandoned later in the Type 38. Along with the rifle, a 6.5mm semi-rimmed cartridge was also introduced.

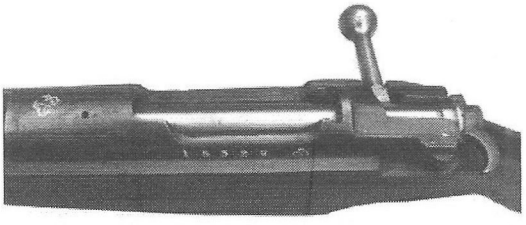
China started purchasing this model at the turn of the 20th century. The safety was a hook like device and it was made of a copper alloy in the early model. Chinese nicknamed this rifle as the "Golden Hook Rifle."

The Type 30 went into battle for first time during the Russo-Japanese War in 1905. After the war, the Japanese decided to use the lessons learned to improve the Type 30. This time the design team was led by Kijiro Nambu. The primary changes were to the receiver and bolt. The result was the Type 38 infantry rifle.



Picture 555 The hook like safety of the Type 30. Turning the hook 90 degrees up engaged the safety. The hook can also be used to re-cock the bolt without opening the bolt in the event that a cartridge didn't go off the first time. The design of the bolt release was very similar to that of the Hanyang rifle.

The Type 30 was no longer a first line weapon when the second Sino-Japanese war broke out. They were mostly issued to rear echelon or garrison troops. Towards the end of war, due to the extreme shortage of almost everything, some Type 30 rifles were refurbished and pressed into service again such as the "North China Type 19."

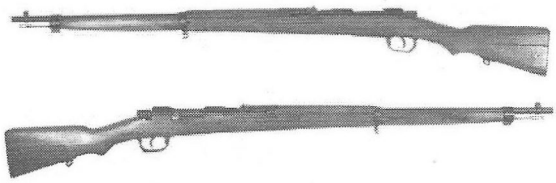


Picture 556 A "North China Type 19" made by the "North China Arsenal" very late in the war using a Type 30 receiver. Note the cherry blossom marking on top of the receiver instead of the usual mum. Courtesy of Victor Lee.

II. Type 38 Infantry Rifle

(See Chapter 4 under Shenxi Produced Type 38 Rifles)

III. Type I Rifle

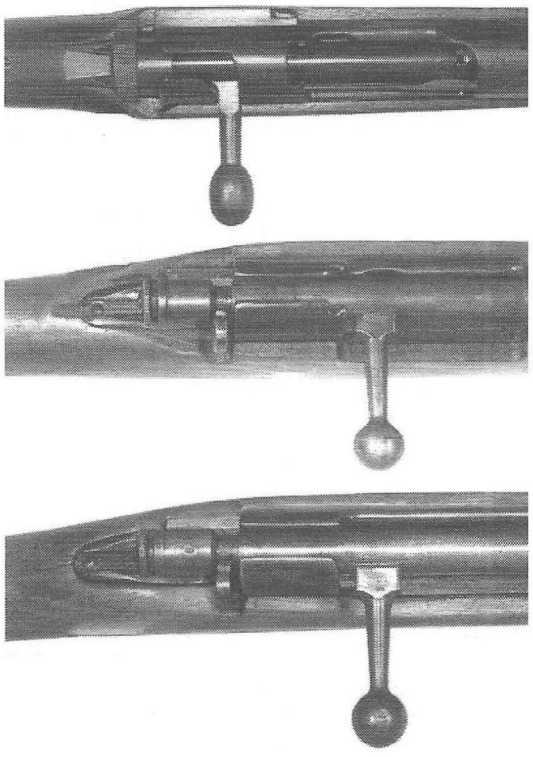


Type I Rifle Specification
Operation Method: Manual Turn Bolt
O/A Length：1,120mm
Barrel Length：800mm
Caliber：6.5x50mmSR
Weight：4.09kg
Muzzle Velocity：730m/s
Feed：5-shot internal magazine

In 1938, the so-called "China Incident" was getting both bigger and wider and more resources were needed every day. Japanese troops were winning battles everywhere but they just couldn't win the war. All Japanese arsenals were already at full capacity. So the Japanese Navy had to turn to its ally Italy for some rifles. This batch of contract rifles was called the Type I (the I stood for Italy). They were designed by Japanese representatives and designers from Terni arsenal. The result was a combination of the Type 38 rifle and the Carcano Model 1891 rifle. Series production was contracted to Beretta and Gardone. The total number produced is believed to be around 60,000.

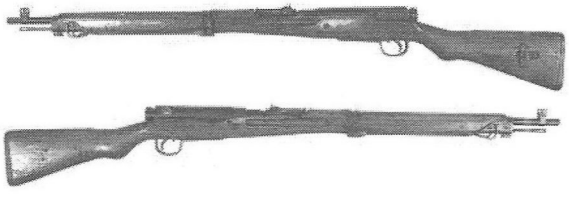
The Type I rifle was still in 6.5mm caliber, clip loading and had an upper-lower joined stock. The receiver and bolt were Carcano type. There was no marking of any kind other than the serial number on the rifle.

The Type I was only issued to Navy personnel. Most were probably issued to security guards for naval bases and never saw any combat. The surviving samples are almost brand new as though they were never used.



Picture 557 The comparison of three rifle receivers. From top to bottom: Type 38, Type I and Carcano 1891. The Type I receiver is similar to that of the Carcano but has charger guide notches.

IV. Type 99 Short Rifle



Picture 558 Type 99 short rifle. Note the side mounted sling swivels and the folded monopod.

Type 99 Short Rifle Specifications
Operation Method: Manual Turn Bolt
O/A Length：1,120mm
Barrel Length：657mm
Caliber：7.7x58mm
Weight：3.7kg
Muzzle Velocity：730m/s
Feed：5-shot internal magazine

Along with the 7.7x58mm cartridges, the Type 99 rifle and Type 99 light machine gun were also adopted in this caliber. The Type 99 started out as a long rifle and the decision was made to turn it into an intermediate length. For that reason it's called the "Type 99 Short Rifle" by the Japanese military. The rifle was an improved version of the Type 38, with some changes made to simplify the production process. The receiver was simplified, the rear sight was changed to a peep sight, the butt plate was changed to a cup shaped type, and some stamped parts were introduced. The design team was led by Major Iwashita Kenzou of the Chigusa Factory, Nagoya Arsenal.

The rifle was adopted in 1939. Based on the Japanese Koki calendar, it was the year 2599 (14th year of Showa), therefore the name "Type 99."

The Type 99 retained the dust cover but the rear sight marking changed from 2,400 meters in the Type 38 to 1,700 meters, and a pair of anti-aircraft wings were added to the rear sight. The devices could be extended down to aid in anti-aircraft shooting. There were small notches on the small wings, each notch represented 100 knots (one knot equates to 1.852 m/h) airspeed. After the airspeed of the aircraft was estimated, the appropriate notch could be used to obtain the correct lead for shooting at the aircraft.

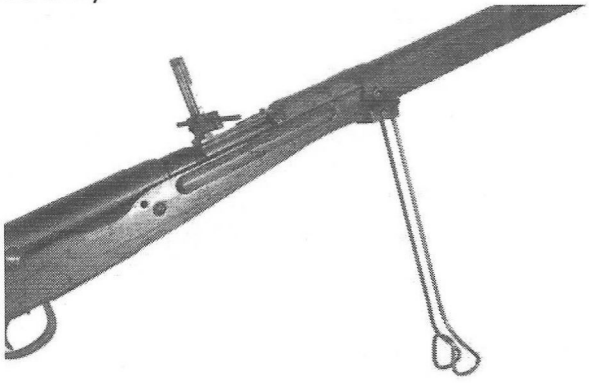
The rear band of the stock had a folding wire monopod attached for stability in aimed fire. These two devices were innovative concepts and the first time that they had appeared on any military rifle. However, the practicality was questionable at best. These features y were the first ones to be dropped in the later production simplification process.

During WWII, all sides used corrosive primers. The early Type 99 rifles had a chrome plated bore and that proved to be very useful

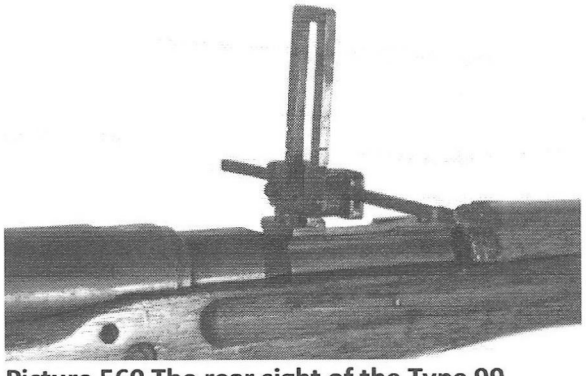
especially in the humid Indochina and Pacific Islands regions. That was a first as well.

Between 1939 and 1945, the total production of the Type 99 was 2.6 million rifles It was the primary first line rifle. Towards the end of the war, Japan suffered great material shortages. All types of production simplified measures were introduced on the Type 99, and these rifles are called "Last Ditch Rifles" by collectors.

After the Type 99 went into service, the Type 38 was not completely replaced. They served concurrently all the way to the end of the war. Visually, the two are very easy to tell apart; the Type 99 had the upper hand guard all the way to the front band (for the non-simplified version).



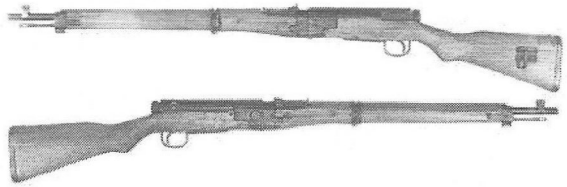
Picture 559 The Type 99 was equipped with a monopod and anti-aircraft wings on the rear sight.



Picture 560 The rear sight of the Type 99. There were two peep sights – one for regular adjustable sighting and one fixed combat sight.

Picture 561 The "last ditch" Type 99 produced by Kokura Arsenal. The Japanese called these "Type 99 Modified" or "Wartime Rifle." The rifle was greatly simplified to save materials and production time. The anti-aircraft wings and the monopod were long gone. The butt plate was made out of a piece of wood. The safety rod and bolt end cap were simply welded together with no checkering. The upper hand guard was shortened. The butt stock was in two pieces lengthwise, joined under the second band. The front sight protector was deleted. The rear sight was a simple peep sight. There was no cleaning rod. The Type 99 marking was deleted, etc. These simplifications were introduced gradually, not all at once. There were a total of 2.6 million Type 99 produced and it is estimated that about a third of them had some sort of simplified features. The later the production date, the more simplified features.

V. Type 2 Rifle



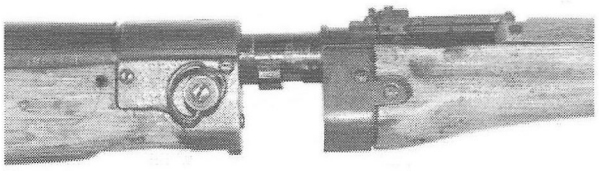
Type 2 Rifle Specifications
Operation Method: Manual Turn Bolt
O/A Length：1,120mm
Barrel Length：657mm
Caliber：7.7x58mm
Weight：4.09kg
Muzzle Velocity：730m/s
Feed：5-shot internal magazine

Germany assisted the Japanese army in establishing its paratrooper units in 1940 and a suitable weapon was needed.

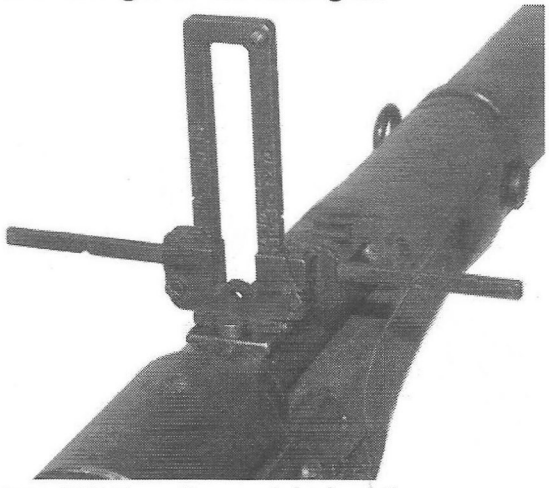
The Japanese high command didn't believe in nor had any suitable submachine guns on hand, so they could only try to modify the rifle already in production. Several different ideas were explored including a folding stock Type 38, but eventually, a modified Type 99 design was chosen. The Type 2 is basically a Type 99 with a take-down mechanism added. It went into production in 1943. This was also the first military series production take-down rifle in the world. It's quite popular with collectors.

The take-down rifle required a lot more machine time than the regular rifle and there were numerous technical issues that needed to be addressed. In the end, it was still a bolt action rifle. For the paratroopers who had to jump behind enemy lines without heavy weapons or possible fire support, the firepower of a bolt action rifle left a lot to be desired.

The Type 2 was only produced at the Nagoya Arsenal, and total production is estimated at 22,000 rifles.

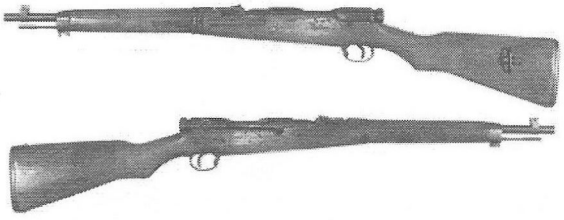


Picture 562 The Type 2 used a pin to secure the front and rear halves. The thumb screw had to be lifted to separate the two. In addition to the serial number, there was an assembly number on the connecting metal parts, whichhad to match to ensure the two halves belonged to the same gun.



Picture 563 Type 2 rear sight had the same anti-aircraft wings.

VI. Type 38 Cavalry Rifle



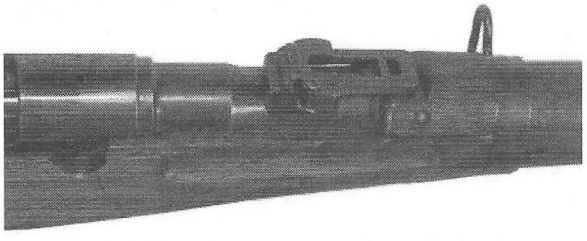
Type 38 Cavalry Rifle Specification
Operation Method: Manual Turn Bolt
O/A Length：966mm
Barrel Length：487mm
Caliber：6.5x50mmSR
Weight：3.34kg
Muzzle Velocity：708m/s

Feed：5-shot internal magazine

When the Type 38 rifle went into production, the Type 38 cavalry rifle was produced concurrently. It was basically a smaller version of the Type 38, with the rear sight ladder shortened and the sling swivels moved to the side. However, it still used a straight bolt handle instead of a bent handle.

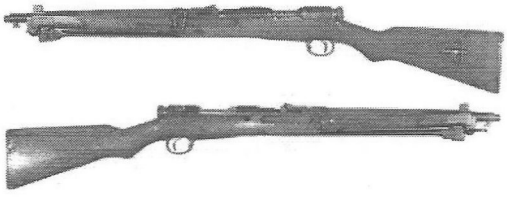
Between 1911 and 1941, Type 38 cavalry rifles and Type 44 cavalry rifles were produced concurrently. Type 44s were mainly issued to cavalry units and Type 38 cavalry rifles were issued to artillery units, transportation units and other non-combat units in addition to cavalry units.

Japan refurbished a batch of Type 38 rifles into short rifles after 1940. The barrel was shortened to 635mm. These rifles still had the long rear sight ladder and bottom mounted sling swivels.



Picture 564 The Type 38 cavalry rifle had a much shorter rear sight ladder but it was still calibrated out to 2,000 meters.

VII. Type 44 Cavalry Rifle

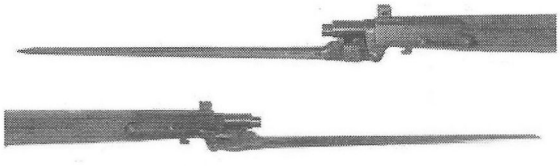


Type 44 Cavalry Rifle Specifications
Operation Method: Manual Turn Bolt
O/A Length：966mm
Barrel Length：487mm
Caliber：6.5x50mmSR
Weight：3.34kg
Muzzle Velocity：708m/s
Feed：5-shot internal magazine

After the Russo-Japanese war, cavalry units found that they often had to dismount to engage the enemy which would eventually lead to a bayonet charge. However, bayonets were often back on the horses so troopers would be in a bad situation without bayonets. It was argued that if a bayonet was directly attached to the rifle, they wouldn't be in that embarrassing situation. Design work was started by Nariakira Arisaka in 1909 and completed in 1910. The new model was named the "Type 44 Cavalry Rifle."

The folding spike bayonet of the Type 44 was a complicated affair and hard to produce. It looked very pretty but its practical usefulness is doubtful. The cavalry rifle was fairly short and to compensate the spike bayonet was extra long. But due to the principle of leverage, the support base also needed to be extra strong. Throughout its production life, the bayonet base was modified three times to lengthen the secure points to achieve more solid support.

The production volume was fairly small because it was only issued to cavalry. The combined production from Kokura and Nagoya Arsenals was 91,000 rifles. Production ceased in 1941 and troops were issued the Type 38 cavalry rifles instead.



Picture 565 The folding bayonet of the Type 44 cavalry rifle. It had doubtful practical usefulness. When a cavalry unit got into a bayonet fight probably they should have broken away in the first place. There were three modifications made on the screw positions on the base and this one is the last

type with the furthest space between the two screws.

Section 4. Pistols

I. Type 14 Pistols

(See Chapter 3 under Japanese Nambu Pistol)

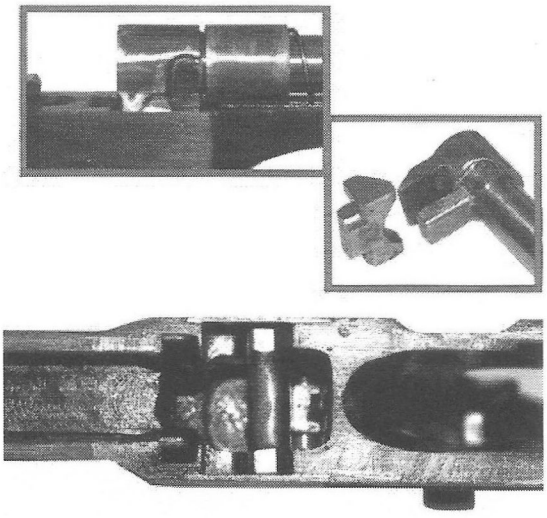
II. Type 94 Pistol

Type 94 Pistol Specifications
Operation Method: Short Recoil
O/A Length：170mm
Barrel Length：96mm
Caliber：8x22mm
Weight：0.78 kg
Muzzle Velocity：260m/s
Feed：6-shot Box Magazine

The Type 94 pistol was adopted in 1934 to supplement the Type 14 pistol for pilots, tankers and other combat personnel who needed more compact side arms.

It's also designed by Kijiro Nambu. It was produced concurrently with the Type 14 for the balance of the war. Total production is estimated to be 7,100 pistols.

To many people, the Type 94 probably is the ugliest looking pistol of all. In addition to the ungainly look, it also had other flaws. One of the biggest problems was that the locking block could be installed in reverse. When it's installed in reverse, the gun no longer had any locking capability and when fired the slide could fly backwards. For all other firearms, designers always ensured that every component could only be installed one way, especially in military firearms. This was clearly an exception.



Picture 566 The locking block of the Type 94. It could be installed in two ways. The one on the gun shown is the correct direction.

Another problem was that the Type 94 had a sear bar which was exposed so the pistol would go off with a little pressure on the bar. Some people jokingly called it a "Suicide Gun" for two reasons; one was that it could go off by accident and two, it was so useless, it could only be used to commit suicide.

Section 5. Light Machine Guns

I. Type 11 Light Machine Gun

(See Chapter 5 under Liao Produced Type 17 Light Machine Gun)

Picture 567 Japanese troops operating a Type 11 light machine gun in a bamboo bush. Japanese military photo.

II. Type 96/99 Light Machine Gun

Picture 568 Japanese Type 96 light machine gun. Note the direction of the carrying handle is facing the opposite direction from most other light machine guns. From Japanese Ground and Air Forces, US War Dept.

Type 96 Light Machine Gun Specifications
Operation Method：Gas operated
O/A Length：1,075mm
Barrel Length：550mm
Caliber：6.52x50mmSR
Weight：10.2kg
Muzzle Velocity：735m/s
Feed：30-round box magazine
Rate of Fire: 500 r/m

Picture 569 Type 96 light machine gun. It's capable of mounting an optical sight and bayonet. Courtesy of PJ Heck.

Type 99 Light Machine Gun Specifications
Operation Method：Gas operated
O/A Length：1,185mm
Barrel Length：550mm
Caliber：7.7x58mm
Weight：10.53kg
Muzzle Velocity：715m/s
Feed：30-round box magazine
Rate of Fire: 850 r/m

Based on combat experience in China, the Japanese army felt that they needed a more modern light machine gun. Kijiro Nambu took on the task and it was adopted in 1936. It replaced the Type 11 and became standard issue. Although the Type 96/99 series had an appearance similar to that of the ZB-26 and Bren series, it was actually a totally different design. (And not as good as either the ZB or Bren).

There was another Type 97 vehicle mounted light machine gun in Japanese army service. It was indeed a copy of the ZB-26 but with a slight different appearance. This was a chaotic situation. It showed that the Japanese military high command apparently lacked the "Total War" concept and there was no coordination or cooperation between services and branches. The wasteful effort to have so many incompatible ordnance items in production concurrently must have put a tremendous burden on the already scarce resource situation.

After the Type 96 entered series production, Nambu continued to improve on the design.

Although oiled cartridges were not needed in this series of weapon, the army insisted on the practice. The oil mechanism for the Type 96 was on the magazine loader, so that the cartridges were oiled as they were loaded into the magazine.

The Type 96 evolved into the Type 99 and there were several improvements made. One important design change was the addition of a head space spacer washer. With the spacer washer, the head space could be adjusted in the factory or repair depot. The "quick change" barrel on the Type 99 was locked by a nut. A wrench was needed to loosen the nut before the barrel could be taken out. That's not something soldiers wanted to do in a combat situation.

The Type 96/99 both had optical mounting provision and a bayonet lug. These again had dubious usefulness. Optical devices could obviously provide more precise aiming but that was not the role for a light machine gun. Besides, in full automatic mode, the second round and subsequent rounds would quickly vibrate the gun out of aim with only a bipod supporting it. It actually greatly reduced the field view of the gunner. There were examples of mounting optical devices on heavy machine guns in other nations but those were more like the optical sights on mortars for long range shooting and the heavy machine gun had a fairly heavy tripod underneath it to provide support.

As for the bayonet, it is doubtful if anyone could perform a bayonet charge with a gun weighing more than 10 kilogram .

The Type 99 light machine gun used the 7.7x58mm cartridge which was the same cartridge as used in the Type 99 rifle. However, due to the increased power, the muzzle flash was increased. To reduce the muzzle flash, a cone shape flash hider was added.

Picture 570 Type 99 firing parts disassembled. Courtesy of PJ Heck.

Section 6. Heavy Machine Guns

I. Type 3 Heavy Machine Gun

(See Chapter 6 under Japanese Type 3 Heavy Machine Gun)

Picture 571 Japanese operating a Type 3 heavy machine gun in the field. Note the complete set of gear on the backpack. The canteens are of the older model. Japanese military photo.

Picture 572 A Japanese line in Shanghai during the 128 incident. There is a Type 3 heavy machine in the foreground and a Type 11 light machine gun in the background.

Note the ammunition box on the left. Japanese military photo.

II. Type 92 Heavy Machine Gun

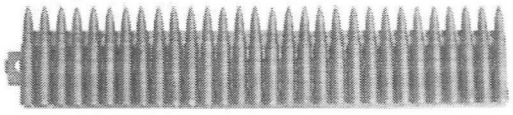
Picture 573 Japanese Type 92 heavy machine gun. Note the attached optical sight. The front legs had transport bars attachments, it could be carried by three soldiers in the deployment configuration. Robert W. Faris collection.

Type 92 Heavy Machine Gun Specifications
Operation Method：Gas operated
O/A Length：1,155mm
Barrel Length：724mm
Caliber：7.7x58mmSR
Weight：28 kg
Muzzle Velocity：732m/s
Feed：30-round feed strip
Rate of Fire: 450 r/m

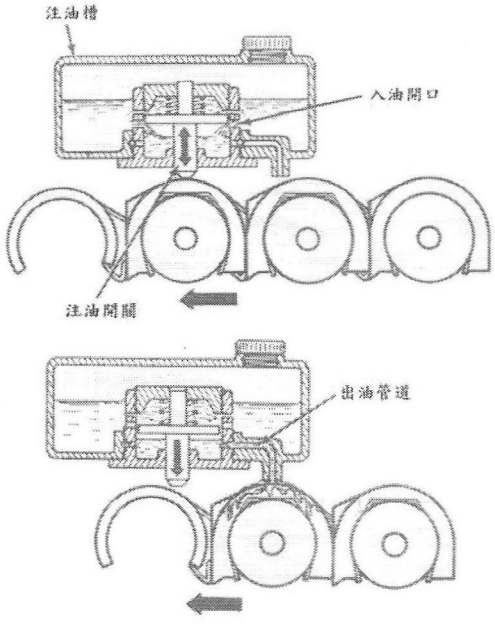
The Type 92 was the last model of the Type 38 and Type 3 series. It was again designed by Kijiro Nambu and adopted in 1932.

This was another weapon improved on based on the "Manchurian Experience." Due to the lack of stopping power of the 6.5x50mmSR, the Japanese army adopted the more powerful 7.7mm semi-rimmed cartridge. The handles were relocated to the bottom to allow operation with gloved hands. Due to the more powerful cartridge, a cone flash hider was adopted.

The Type 92's actual rate of fire was below 300 rounds per minute. The gun was extremely heavy. It also could not maintain long periods of sustained fire. Compared to other heavy machine guns of the period, it's really an inferior weapon.



Picture 574 Type 92 7.7mm 30-round feed strip.

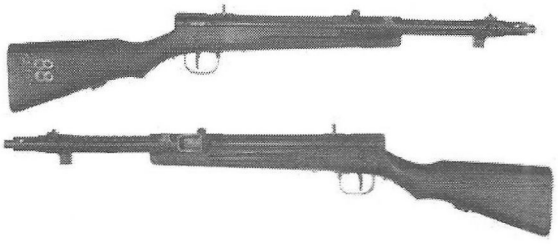


Picture 575 The Type 92 had an oil reservoir to oil the cartridges before they were fed into the chamber. [80]

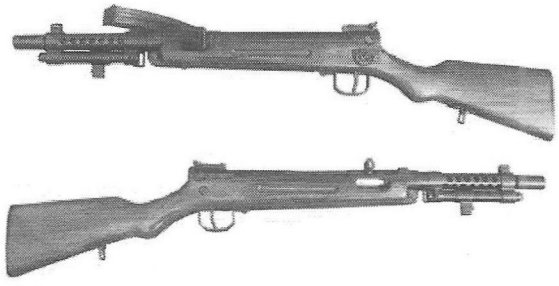
[80] Reference 13, Vol. I, p. 288.

Section 7. Other Ordnance

I. Type 100 Submachine Gun



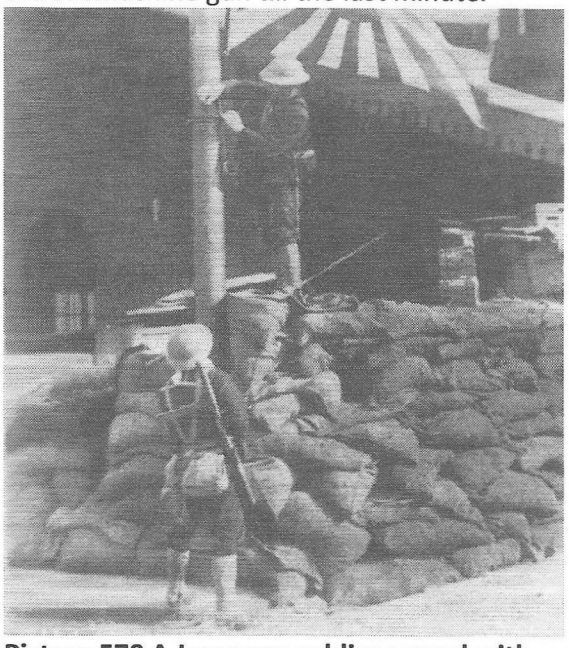
Picture 576 A late model Type 100 made by Nagoya Arsenal, serial number 3686. The rear sight and bayonet were simplified. Source F.



Picture 577 This is a 1:1 full metal Type 100 model gun made in the 60s in Japan. It's modeled after the early pattern and had the rifle rear sight and the bayonet attachment assembly was quite elaborate. Courtesy of Hiroki Nakazato.

Type 100 Submachine Gun Specifications
Operation Method：Blow-back
O/A Length：914mm
Barrel Length：234mm
Caliber：8x22mm
Weight：3.86 kg
Muzzle Velocity：305m/s
Feed：30-round box magazine
Rate of Fire: 800 r/m

The period between the end of WWI and the end of WWII was the golden age of submachine guns. Several famous models were developed and put into mass production. The STEN gun was the extreme in terms of low cost and ease of manufacture. The Soviet Union also produced tremendous numbers of submachine guns. There were times when a whole battalion of soldiers armed with submachine guns were firing and charging towards the enemy. The Japanese military high command obviously knew about these trends but resisted the development of the submachine gun till the last minute.



Picture 578 A Japanese soldier armed with what appears to be a Sig M-20 submachine gun during the 128 Incident. Japanese military photo.

It was not until 1935 that the Japanese army decided to look into the development of a submachine gun. The final design was developed by the Nambu Factory, Chuo Kogyo, and adopted in 1940. The actual production was done by Nagoya Arsenal. It had taken the Japanese military five years to decide. It wasn't because there was no good design; rather it was due to indecision on the military's part.

Even after the adoption, the Japanese military still didn't know what to do with the gun. One thought was to use it as a self-defense weapon for high ranking artillery and cavalry officers. This was another first in the world. Among the less than 10,000 guns produced, there were several variations – paratrooper's folding stock, guns with

attached bipod, etc. This showed that the Japanese military really had no idea what the submachine gun's tactical role should be.

By the time the Type 100 entered service, Japan had already lost control of both air and sea, so guns produced couldn't be shipped to front line troops. Most of the guns stayed in Japan till the end of the war.

The Type 100 was basically the same design as the Bergmann series and belonged to the first generation of submachine guns. It adopted some stamped parts and had some spot welding but the receiver was still milled and it was fitted with a wood stock.

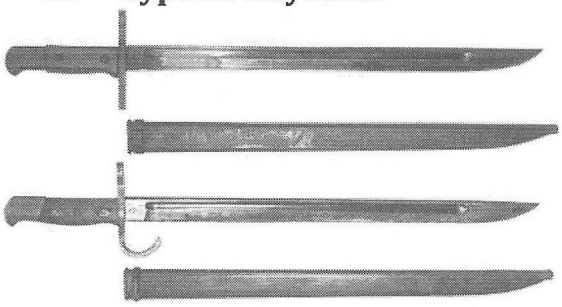
Based on the common wisdom of Japanese military, the Type 100 was also fitted with a bayonet. Strangely, it didn't use the regular Type 30 model bayonet but another shorter version. The gun was short to begin with and, when fitted with a short bayonet, the real purpose of this combination was puzzling. In contrast to the Japanese, the Chinese knew what the role submachine gun was in war. The Chinese translation said it all – it's called an "Assault Gun."

The early model only had a rate of fire of 450 RPM. In the later model, the buffering mechanism was simplified and the rate of fire rose to about 700-800 RPM.

The power of the Type 100 was also limited by the cartridge it used. It didn't see much real action. The major combat in which the Type 100 took part was the defense of the Philippines and Okinawa. The rest of the guns were waiting for the final battle on the Japanese main islands.

The Type 100 was late to the war, production was fairly small and' due to transportation limitations, it didn't see too much action. It was simply a footnote to Japanese small arms during the war.

II. Type 30 Bayonets



Picture 579 The two basic types of the Type 30 bayonet with different styles of crossguards. The handles were also different.

Type 30 Bayonet Specifications
O/A Length：527 mm
Blade Length：400 mm
Weight： 0.69 kg

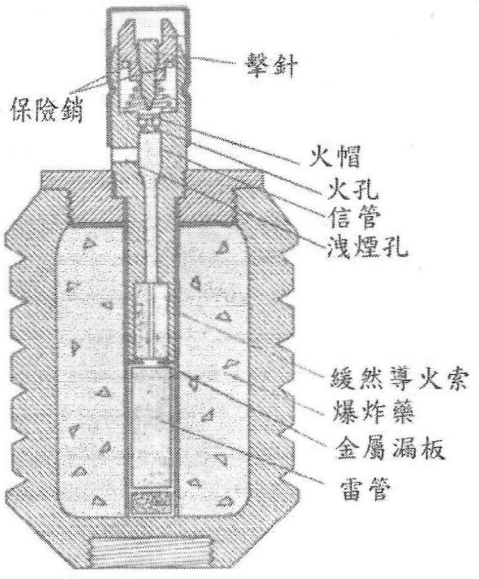
The Type 30 bayonet was first introduced with the Type 30 rifle. All subsequent Japanese rifles were fitted with this pattern of bayonet. Therefore there is no such thing as a Type 38 bayonet or a Type 99 bayonet.

Over time, there were a few simplified steps taken to increase production. The first was that the quillion was changed to a straight crossguard. The raised front portion of the handle (belly) was changed to a straight line. The base of the hilt was changed to a flat shape, and the curve was deleted. The end of the scabbard originally had a water drop shaped weld and it was replaced by a simply ground off tip.

The Type 30 was produced by a lot of commercial contractors in addition to the four arsenals. These bayonets would have two markings on the ricasso.

The Type 30 bayonet was serialized but the number had nothing to do with the rifle with which it was issued. The numbers didn't match right from the beginning.

III. Type 91/97/99 Hand Grenade

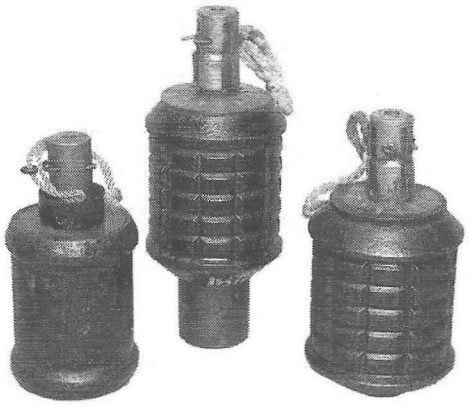


Picture 580 Type 91 grenade section view. Japanese hand grenades all followed the same basic design. Note the indent on the bottom for booster installation. Recreated based on Handbook on Japanese Military Forces, US War Dept.

Type 91 Hand Grenade Specifications
O/A Length：125 mm
Diameter：50 mm
Weigh：0.53 kg
Fuse Burning Delay：7-8 sec

Type 97 Hand Grenade Specifications
O/A Length：100 mm
Diameter：50 mm
Weigh：0.45 kg
Fuse Burning Delay：4-5 sec

Type 99 Hand Grenade Specifications
O/A Length：80 mm
Diameter：45 mm
Weigh：0.30 kg
Fuse Burning Delay：4-5 sec



Picture 581 The three types of Japanese hand grenades. From the left: Type 99, Type 91 and Type 97. Courtesy of www.Inert-Ord.Net.

The most interesting feature of the Type 91 hand grenade was its ignition mechanism. It contained accelerator, firing pin, safety pin and firing cap. The accelerator and firing pin were separated by the safety pin under normal conditions.

When it was to be used, the safety pin was first removed, the grenade held and the tip of the grenade hit on a solid surface such as a helmet or the sole of the boot. The soft copper tip would be crushed, resulting in the accelerator hitting the firing pin. The firing pin in turn would hit the firing cap and initiate the burning of the fuse.

The Type 91 could be used with the grenade discharger. There was a section on the bottom of the grenade for the installation of a booster. When used with the grenade discharger, only the safety pin needed to be removed, there was no need to strike the grenade.

The Type 97 was similar to the Type 91 but with a shorter fuse burning time. The booster installation indent was also deleted. It used a simplified accelerator and firing pin design. The Type 97 could only be used as a hand grenade It was the most widely produced model during the war.

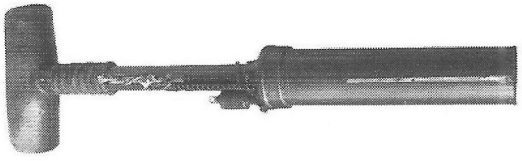
The Type 99 was a simplified version of the Type 97. It's smaller, lighter and has a smooth body..

IV. Type 10 Grenade Dischargers

(See Chapter 7 under Japanese Type 10 Grenade Discharger)

Picture 582 A Japanese soldier operating a Type 10 grenade discharger during the 128 Incident. Japanese military photo.

V. Type 89 Heavy Grenade Discharger



Picture 583 Type 89 heavy grenade discharger. Courtesy of Mark Strange.

Type 89 Heavy Grenade Discharger Specifications

Operation Method：Gas propelled
O/A Length：623mm
Tube Length：248mm
Caliber：50mm
Weight：5.2kg
Feed：Single shot

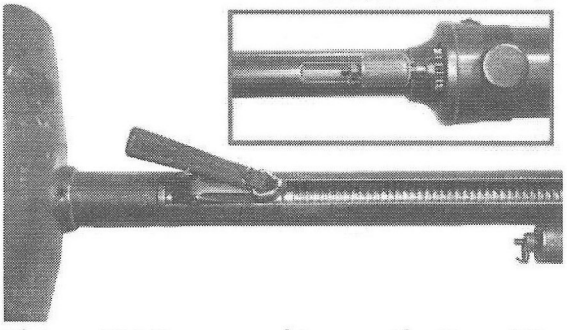
The Type 89 was the improved and scaled up version based on the successful deployment of the Type 10. Grenade dischargers were a unique weapon widely issued by Japanese troops.

The Type 89 had a rifled barrel and a special Type 89 grenade was developed for its use. The maximum range was 670 meters. The Type 89 grenade weighed 0.8 kg, and each soldier carried 18 grenades.

The grenade discharger squad consisted of 3 men, who carried the discharger and grenades. In rapid fire, they could launch 20 grenades per minute. In Northern China and Northwestern China, the terrain is flat and there is not much vegetation, so grenade dischargers were very effective. Any exposed position would immediately be bombarded by Japanese grenade dischargers.

In the Pacific Islands, it was not as effective due to the thick jungle. The grenade might be affected by tree cover and branches.

The Type 89 could also use the Type 91 grenade with booster. However, because it didn't have the copper ring for the rifling and the grooved body didn't fit tightly in the barrel, the maximum range was reduced to 190 meters.

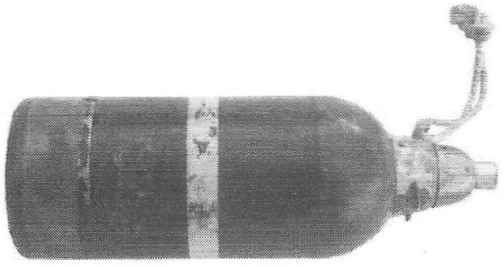


Picture 584 Range markings on the Type 89 base tube. The insert shows the adjustment wheel. Robert W. Faris collection.

The Type 89 has a different mechanism for range adjustment. There is a rod inside the barrel and the grenade sits on top of it. The range is determined by how deep the grenade sits inside the barrel. The deeper the

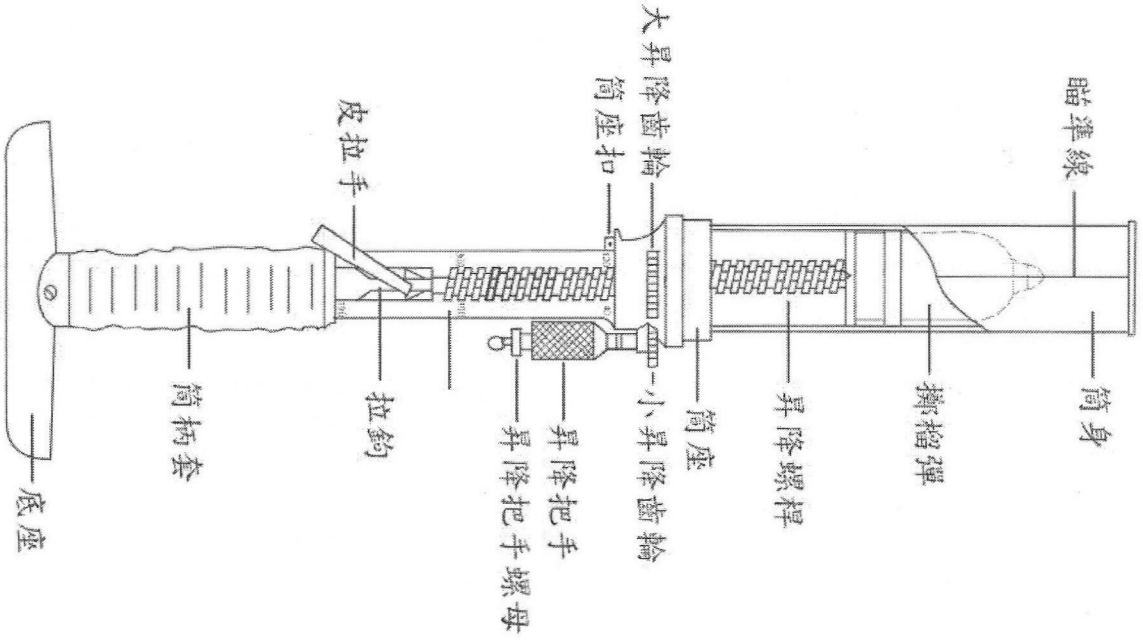
grenade sits inside the barrel, the longer the acceleration provided by the gas, and the longer distance the grenade could reach.

Then Type 89 grenade had a kill zone of 10 meters. When a dozen of these fell on an infantry position, they could really have a devastating effect.

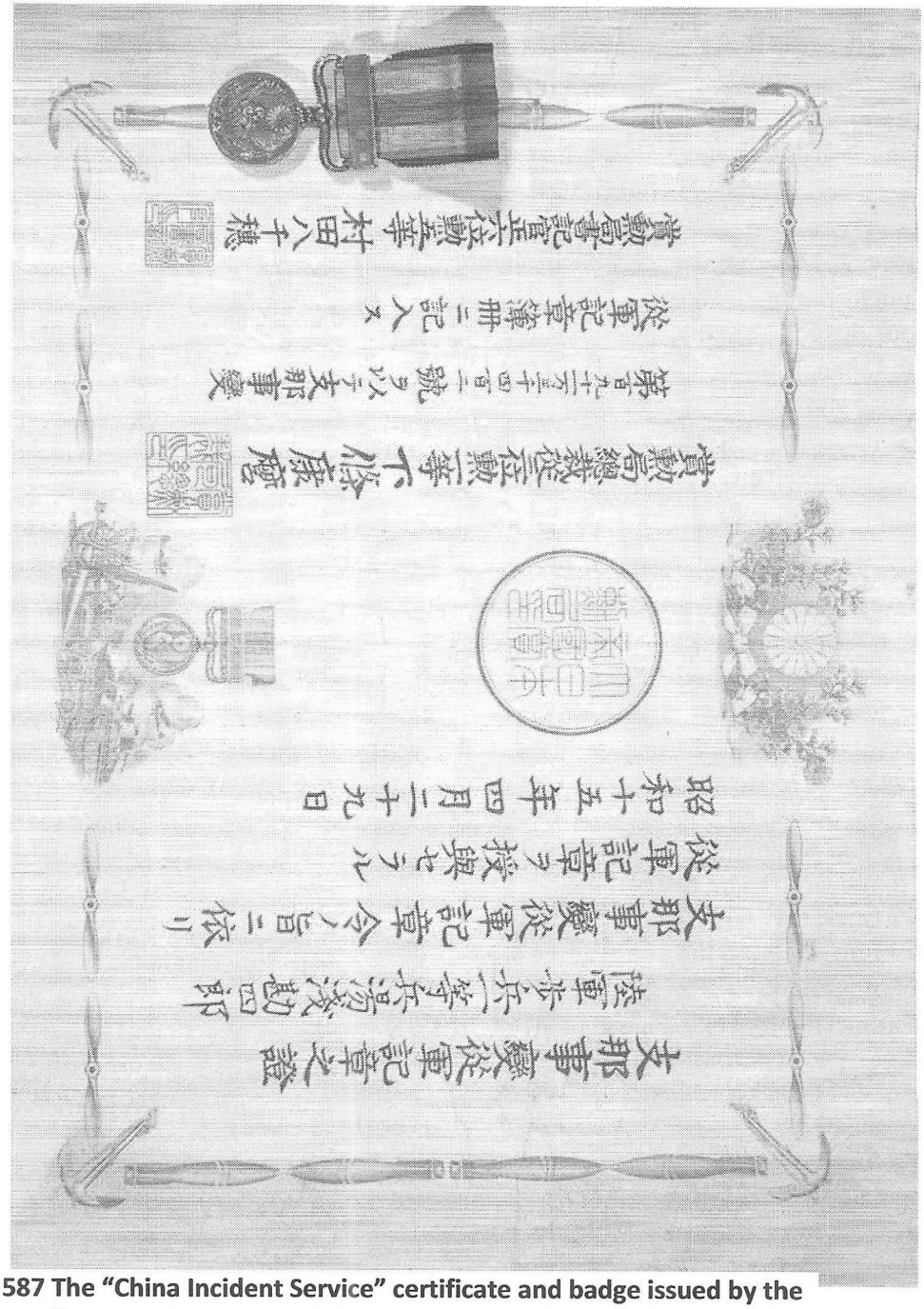


Picture 585 Type 89 grenade.

Was a bigger and longer range Type 89 grenade discharger necessary? The most common infantry encounters were between two or three hundred meters. If any longer than that, artillery or mortar fire would be called in. The Type 89 wasn't powerful enough and couldn't be used as an artillery barrage before an infantry advance. The ability to reach out for four hundred meters and beyond seems to be a waste. Maybe it was due to this tactical consideration that the Chinese military chose the lighter Type 28 grenade discharger, which was similar to the Type 10 grenade discharger.



Picture 586 Sectional view of the Type 89 grenade discharger. Recreated based on the Type 27 grenade discharger instruction manual, from the 30th Arsenal, China.



Picture 587 The "China Incident Service" certificate and badge issued by the Japanese military on April 29, 1940. There were over three million issued. The Japanese high command probably thought that the so-called "China Incident" was over.

Appendix I. Reference Books and Small Arms Resources

Section 1. China's Small Arms Exhibition

Armed Forces Museum, Taipei, Taiwan. Open to the public during the day.
Ordnance History Museum, inside the 202nd Arsenal, Taipei, Taiwan. It is only open to the public once a year.

Ordnance Display Museum, the 205th Arsenal. Kaoshung, Taiwan. Not open to the public, special permission only.

Ordnance Museum, National Defense University, Zhong Li, Taiwan. It is only open tothe public once a year.
China News Agency, Taipei, Taiwan. Resource for war time news photo.
http://www.cnavista.com.tw/
Shanghai Police Museum, Shanghai, China. Open to the public, no photography allowed.
Beijing Militia Museum, Tong Zhong, Beijing, China. It appeared to be closed.
People's Liberation Army Military Museum, Beijing, China. Open to the pubic, some areas allow photography.
MoD, Pattern Room, England. Not open to the public, special permission only.
Library of Congress, Washington DC, US. Open to the public.
National Archives, Washington DC, US. Open to the public.
United States Army Ordnance Museum, Fort Lee, Virginia, US. Open to the public.。
The Army War College, Carlisle, Pennsylvania, US. Special permission only.
Getty Images：Including Time & Life Pictures and Hulton Archive historical news photos.
http://creative.gettyimages.com/

Section 2. References

1. **A Brief History of Eight Years of War of Resistance(八年抗戰經過概要)**：General Chen Cheng, Chief of China's General Staff, 1946.
2. **China's Modern Ordnance Industry Historical Records (1-4)(中國近代兵器工業檔案史料(一~四))**：Modern China's Ordnance Industry, Historical Records Committee, 1993, Ordnance Industry Press, Beijing, China.
3. **China's Modern Ordnance Industries : From Late Qing Period to the Republic (中國近代兵器工業)**, Modern China's Ordnance Industry Committee, first edition, 1998, Defense Industry Press, Beijing, China.
4. **The Chungking Ordnance Industry During the War (抗戰時期重慶的兵器工業)**, Lu Dayue (陸大鉞), Tang Runming (唐潤明主編), Chungking War of Resistance Series Committee, first edition, 1995, Chunking Press, Chungking, China.
5. **The China Domestically Produced Small Arms Review (國造槍械列傳)**, Lin Zuoyi (林佐乙), 1999, Global Defense Magazine, Taipei, Taiwan.
6. **Shandong Guerilla Bases (山東根據地)**，Xue Xingfu (薛幸福),1990, Ordnance Industry Press, Beijing, China.
7. **Shenxi, Henan and Hebei Guerilla Bases (晉冀豫根據地)**, Wu Dongcai(吳東才), 1990, Ordnance Industry Press, Beijing, China.
8. **Ordnance Records of Shenxi, Chahaer and Hebei Guerilla Bases (晉察冀根據地軍工史料)**, China Ordnance History Records Edit Committee, Fang Min(方敏), 1993, China Ordnance Industry Corp.
9. **Ordnance Records of Shenxi and Suiyuan Gerilla Bases (晉綏根據地軍工史料)**, China Ordnance History Records Editorial Committee, Xue Xingfu (薛幸福), 1990, China Ordnance Industry Corp.

10. **Shaaxi, Ganxu and Ningxia Frontal Regions (陝甘寧邊區),** Xue Xingfu (薛幸福),1990, Ordnance Industry Press, Beijing, China.
11. **Jiangxu Modern Ordnance History (江蘇近代兵工史略),** Jiangxu Historical Records Editorial Department, Jiang Hong (江洪), Hou Futong (侯福仝), 1989, Nanjing, China.
12. **Jiangnan Manufacturing Records (江南製造局記),** Qing, Wei Yungong (魏允恭), 1997 reprint by Shanghai Ancient Book Press.
13. **The Machine Gun**, George M. Chinn, Vols I-V, Department of Navy, US.
14. **Inglis Diamond,** The Canadian High Power Pistol, Clive M. Law, 2001, Collector Grade Publication.
15. **The Bren Gun Saga**, Thomas B. Dugelby, Collector Grade Publications, 1999, revised and expanded edition, P.O. Box 1046 Cobourg, Ontario, Canada K9A 4WS.
16. **The Devil's Paintbrush: Sir Hiram Maxim's Gun**: Dolf L.Goldsmith, Collector Grade Publication Inc., Toronto, Canada, 1993.
17. **China's Nation-Building Effort**, Arthur Young, 1971, Hoover Institution Press, Stanford University.
18. **Germany and Republican China**, William C. Kirby, 1984, Stanford University Press, Stanford, California, US.
19. **Shinagun Heiki Yoran** (Guide to the Weapons of the Chinese army), WDC164382, Library of Congress, Washington Document Center -WDC
20. **A Different Kind of War**, Milton E. Miles, Doubleday & Company, Inc, Garden City, New York, 1967.
21. **OSS in China : Prelude to Cold War**, Maochun Yu, New Haven, CT: Yale University Press, 1996.
22. **The Mauser Self-Loading Pistol**, James N. Belford & Jack Dunlap, 1969, Borden Publishing Company, Alhambra, California
23. **System Mauser**, John W. Breathed, Jr. & Joseph J. Schroeder, Jr., 1967, Handgun Press, Chicago, Illinois.
24. **Small Arms of the World**, W.H.B. Smith, 5th Edition, 1955, Military Service Publishing Company, Harrisburg, Pennsylvania.
25. **Hatcher's Notebook**, Julian S. Hatcher, The Stackpole Company, 3rd Edition, April 1966. Harrisburg, Pennsylvania, USA.
26. **Mauser Bolt Rifle**, Ludwig Olson, 13th edition, 1997, F. Brownell & Son Publication Inc., Montezuma, Iowa, USA.
27. **Arming the Dragon**, Mauser Rifle Introduction in China, 1895-1950, Dolf L. Goldsmith, P.O. Box 791870, San Antonio, TX 78279, USA.
28. **Mauser Military Rifles of the World**, Robert W. D. Ball, 1996, Krause Publications, 700 E. State Street, Iola, WI 54990.
29. **General Shooting and Ordnance Information. (大眾射擊與兵器知識),** Qian Shijian (錢石堅), 1939, Shenhua Press.
30. **Infantry Weapons Manual,** in English and Chinese, China Expedition Forces Command, India, 1943.
31. **Anglo-Chinese Military Terminologies Dictionary**, published during the war by an unknown source.
32. **Ordnance Design and Theory (槍炮構造及理論),** Li Daichen (李待琛), Vol. 1 and 2, 1938, Ordnance School.
33. **Guns – Volume One of Ordnance References (槍械 – 兵器參考材料之一)**, Ordnance Research Office, The Third Field Corp. of Eastern China, August, 1952.
34. **China's Ordnance Development History (中國兵器製造業發展史),** Wang Guoqiang (王國強), 1987, Liming Culture Inc, Ltd, Taipei, Taiwan.
35. **Arms & Ammunitions of Japan – A Catalog of Taihei Kumiai (日本陸軍兵**

器資料集 -(泰平組合目錄)), Munkakata Kazuhro, Hyodo Nishohachi, 1999, Namiki Press, Tokyo, Japan.

36. **The Complete Book of Type Triple-Tens Machine Gun (三十節式機關槍全書),** Zong Mingjie (宗明杰), 1930, Minshen Monthly, Hankow, China.
37. **Type 24 Maxim Machine Gun Instruction Manual (二十四年式馬克沁機關槍說明書),** 6th edition, the 21st Arsenal, 1948.
38. **Type 28 Grenade Launcher Instruction (二八式槍榴彈教程),** 80th Arsenal, 1947.
39. **Type 27 Grenade Discharger Instructions (二七式擲彈筒使用法),** second edition, 30th Arsenal, 1940.
40. **The Specifications of Chinese Army Small Arms in Services (我國陸軍現用各武器諸元手冊),** Ordnance Office of the Combined Services Command, September, 1947.
41. **Munitions Identification (彈藥識別),** Ordnance Department, Supply Command, Eastern China Military Zone. February 25, 1949.

Appendix II. Idioms & Terminologies

Ordnance and Military Terms[81]			
Chinese	English	Other Name	Notes
加速子 助力心子	Accelerator		In a recoil operated weapon, the accelerator provides the energy to complete the cycle after the barrel has stopped.
退火	Anneal		A process of heating metal to a lower temperature to increase its ductility
火帽室	Anvil(Cartridge)		In the Boxer primer, the anvil is part of the cartridge primer; in the Berdan primer, the anvil is integral with the cartridge case,
待擊	Armed/Cocked(Gun)		Compress the hammer or firing pin spring so the arm is ready to fire.
破甲(彈)	Armor Piercing (AP)	穿甲(彈)	A bullet with a steel or tungsten core to pierce solid material.
後牆板	Back Plate (Machine Gun)		The back side of a box type receiver such as that of the Browning or Maxim machine guns.
尖彈	Ball (Cartridge)		A lead core bullet with a full jacket of a brass alloy
槍管	Barrel	槍筒	The part of the gun which projects the bullet
節套 滑機(二四式)	Barrel Extension		
套筒	Barrel Jacket		The jacket surrounding the barrel on the German M1888 and original Hanyang rifle..
底帶式	Belted (Cartridge)		The raised belt on the base of the cartridge case
機心	Bolt	槍栓 槍機 槍門	
機管	Bolt Body		
	Bolt Carrier	槍機框	
機關體	Bolt Group/Lock (T24 Maxim)		
機柄	Bolt Handle	拉柄	
機球	Bolt Handle Knob		
鎖機	Bolt Locking Block(C96)		
定位銷	Bolt Sleeve Lock(Mauser)		The sleeve lock is to prevent the Mauser cocking piece from rotating.
機尾	Bolt Sleeve(Mauser)		
卡機簧 機管軋	Bolt Stop(Mauser)		
槍膛	Bore		

[81] Many terms were from Reference 31.

斷殼起子	Broken Shell Extractor		A tool used to extract a cartridge case with no base from the chamber.
彈頭	Bullet (Cartridge)		A bullet is that part of the cartridge that comes out of the barrel when the cartridge is fired
點放	Burst Fire		
托底板	Butt Plate (Stock)		
(表尺)分劃	Calibration (Sight)		
歪輪	Cam	凸輪	
子彈	Cartridge		
公分	Centimeter		
彈膛	Chamber (Barrel)		
通條	Cleaning Rod		
預發位置	Cocked		
阻筍	Cocking Piece (Bolt)		
槍鼻	Comb Nose (Stock)		The raised portion of the butt stock.
集束彈道	Cone of Fire		
連續放	Continuous Fire		
搖架 鞍架 槍鞍	Cradle (Tripod)		The base which secures a machine gun on a tripod.
導火索	Detonating Cord		
分離子	Disconnector		The device to prevent premature firing.
復進簧	Driving Spring (Browning MG)		
防塵蓋	Dust Cover		
排殼槽	Ejection Slot		
頂殼針	Ejector	拋殼挺 排殼挺	
高低手輪	Elevation Handwheel		
拉彈鉤	Extractor	拉殼鉤	
退殼用凹槽	Extractor Groove (Cartridge)		
給彈機	Feed Mechanism		
坡膛	Feed Ramp		
射界	Field of Fire		
撞針	Firing Pin	擊針 中針	
防火罩	Flash Hider	防火帽 槍口罩	
避光片	Flash Hider Disk (T24 Maxim)		
彈倉底板	Floor Plate (Magazine)	彈倉蓋	
底板扣銷	Floor Plate (Magazine) Catch		
托彈板	Follower (Magazine)		
上背帶環	Front (Upper) Sling Swivel		
準星	Front Sight Blade		
準星罩	Front Sight Cover		
公分 克	Gram (Weight)	公克	
(槍管)陰線	Groove (Rifling)		
擊鎚	Hammer	擊鐵	
上護木	Hand Guard (Stock)		
膛隙	Head Space		

槍前踵 托踵	Heel (Stock)		
公斤	Kilogram		
(槍管)陽線	Land (Rifling)		
繫環 繩環	Lanyard Ring/Loop		The ring on the gun to which to tie a lanyard to prevent the accidental loss of a side arm.
導片	Leader Tab (MG Belt)		
機座	Lock Mechanism Frame		The locking mechanism of the M96 pistol.
機鎖	Locking Block		
機耳	Locking Lug		
閉鎖滾子	Locking Roller		
彈匣	Magazine	彈盒	
彈匣扣	Magazine Catch		
裝彈機	Magazine Loader		
彈匣門	Magazine Release	彈盒扣	
復進簧	Main Spring		
白藥 雷汞	Mercury Fulminate		The chemical used in the cartridge primer.
米突	Meter	米達 公尺	
密位	Mil (Artillery)		
公厘 厘米	Millimeter		
	Operating Rod	復進桿 推桿	The rod to transfer motion in a gas operated weapon.
超越射擊	Overhead Fire		
描門 準門	Peep Sight	覘孔	
侵澈力	Penetration		
托槍機套筒	Pintle Housing (T24 Maxim)		
握把 槍把	Pistol Grip (Small of theStock)		The portion of the buttstock the shooting hand grasps.
	Piston	活塞	
火帽	Primer (Cartridge)	底火	
彈丸	Projectile		
滑槽	Rail (Receiver)		
備便	Ready		
下背帶環	Rear (Lower) Sling Swivel		
照門 表尺	Rear Sight		
表尺	Rear Sight Leaf		
游標	Rear Sight Slide		
機槽 節套	Receiver	機匣 槍匣 機框 機箱	That part of the gun into which the barrel screws and which contains the bolt and trigger mechanism.
枕鐵	Recoil Lug		In a rifle, the portion of the receiver that prevents rearward movement of the barreled receiver when fired
復進簧	Recoil Spring		
無起緣	Rimless	無底緣	
全起緣	Rimmed		
鉚釘	Rivet		
圓彈 元彈	Round Nose (Cartridge)		

保險	Safety		
刺刀鞘	Scabbard		
扣機	Sear	扣門	The sear is that part of the trigger mechanism which holds the hammer or striker back until the trigger is pulled.
扣門斜面	Sear Cam		
制發器	Selector (MG)	單連發機	
半起緣	Semi-Rimmed	半底緣	
缺口	Sight Notch		The notch on the rear sight for aiming.
背帶	Sling		
架槍環	Stacking Swivel		For stacking guns in the field.
避汽管	Steam Escape Tube (T24 Maxim)		
槍托	Stock	木托	
機槍掃射	Strafing		
橋夾 條夾	Stripper Clip		A speedy way to load cartridges into guns invented by Mauser.
槍後踵 托頭	Toe (Stock)		
上蓋板	Top cover (Machinegun)		
方向機	Traverse Mechanism		
方向固定銷	Traversing Clamp (T24 Maxim)		
扳手 扳機	Trigger		
護圈	Trigger Guard	護弓	
扳機箱	Trigger Housing		
群射 齊放	Volley		
挖斯	Washer		
套筒	Water Jacket (T24 Maxim)	水套	

二劃

TNT (Trinitrofoluene)：A chemical compound with the formula C6H2(NO2)3CH3. This yellow-colored solid is best known as a useful explosive material with convenient handling properties.

力拂廠 (Ludwig Loewe)：A commercial company set up by Ludwig Loewe in 1869 in Berlin, Germany. It started producing arms in 1872. It later acquired many other firms including Mauser to form the conglomerate Deutsche Waffen und Munitionsfabriken (DWM). The Loewe family was forced to leave Germany in 1930 by the Nazis.

三劃

士乃德 (Schneider)：Schneider had been making most of the French guns since the time of Louis XVI in 1782. It's a large conglomerate comprised of coal and iron mines, firebrick works, blast furnaces, coke ovens, steel works, armor plate works, electrical construction works, ship and bridge building yards, gun shops, and proving grounds in addition to the artillery pieces.

三箭牌、箭牌擼子：Chinese nickname for Beretta pistol due to the three-arrow logo.

四劃

水機槍、旱機槍(重機槍)：Water cooled and air cooled machine gun.

手雷：Hand grenade.

水連珠，三線步槍：Chinese name for the Mosin-Nagant rifle.

毛瑟手槍、盒子炮、駁殼槍、自來得、匣子槍、快慢機：Various Chinese names for the Mauser 1896 pistol.

毛瑟 (Mauser)：The famous German arms maker, part of DWM and famous for its M1898 and Kar98k rifles.

王八盒子、雞腿擼子：Chinese name for Nambu pistol.

反衝式 (Blow Back)：One of the primary firearm operating principles for self-loader. The bolt rests against the base of the cartridge case and held there only by a recoil spring that is compressed by the kinetic energy of the bolt when it is thrown back in recoil.

五劃

白格門、伯格曼 (Bergmann)：German factory Waffenfabrik Theodor Bergmann which produced the MP-18.

布郎德 (Brandt)：Edgar Brandt Company, French mortar manufacturer established in 1912. It's known for its 60 and 81mm mortars adopted all over the world.

司科達 (Skoda Works)：Established by Emil Skoda in 1899, world renowned steel refinery and heavy machine producer. It's also known for the heavy artillery pieces it produced.

半自動步槍 (Semi-automatic Rifle)：Self loader, the action cycles itself and reloads the next round.

卡賓槍 (Carbine)：Carbines use to refer to short rifles used by cavalry or artillery troops. After the US adopted the M1 Carbine, it became synonymous with that weapon.

甲雷：Land mine.

六劃

百祿 (Bohler)：Austrian steel manufacturer known for its barrel steel and artillery pieces

合步樓公司 (Hapro -Handelsgesellschaft fur Industrielle Produkne)：A German trading company supposedly owned by Hans Klein. It mainly handled arms trading to China for Germany. Most historians believe it was supported by the Reichswehr of the Weimar Republic.

白浪林/白朗寧/卜郎寧 (John Browning)：Great American ordnance inventor.

七劃

夾具 (Jig, Fixture)：The device used to hold parts to machine the correct angle and position.

車 (Lathe)：A lathe is a machine tool which spins a block or cylinder of material so that cutting tools can be applied to the work piece.

步槍 (Rifle)：Infantry shoulder weapon, the progression of rifle technology greatly changed the tactics of warfare.
汽退式 (Gas Operated)：The type of firearm design thatuses a portion of the high pressure gas from the cartridge being fired to power a mechanism to extract the spent case and chamber a new cartridge.
克虜伯 (Krupp)重工：German heavy equipment manufacturer established in 1811 by Friedrich Krupp. Iit started out as an iron and steel refinery and expanded into ordnance, engine, ship building, etc.

九劃
派拉伯林 (Parabellum)：DWM's registered trade mark for its 9x19mm cartridge. It comes from the Latin phrase "Si Vis Pacem, Para Bellum," meaning "If you wish for peace , prepare for war."
重管自動步槍 (Automatic Rifle)：An older term referring to squad automatic rifles such as the US BAR.
苦味酸、硝基苯酚 (Lyddite, Picric acid)：A type of explosive easy to produce but not very stable.

十劃
泰平組合公司 (Taihei Kumiai)：Japanese Arms conglomerate formed by Mitsui Co. Ltd., Okura Co. Ltd., and Takeda Trading in 1908.
格魯森廠 (Grusonwerk)：Acquired by Krupp in 1892, and located in Magdeburg, Germany. Famous arms maker.
馬克沁 (Maxim)：Hiram S. Maxim, American inventor who invented the first successful fully automatic machine gun.

十一劃
索落森/蘇羅通 (Solothurn)：A Swiss ordnance company acquired by Rheinmetall in 1929 to market ordnance on the international market.
啟拉利 (Kiraly)：A Swiss light machine gun called Neuhausen KE7, designed by Kiraly and Ende, and manufactured by SIG.
麥特森 (Madsen)：Danish ordnance company known for its Madsen machine guns.

十二劃
博福斯、普福斯、卜福斯 (Bofors)：Swedish ordnance company established in 1646. It was acquired by Nobel in 1894 and started producing ordnance. It's known for its artillery pieces.
萊因重工 (Rheinmetall)：Rheinische Metallwarren und Maschinefabrik Actiengesellschaft Established in 1889 by Heinrich Ehrhardt, it's one of the most important heavy equipment and ordnance manufacturers in Germany.
斯托克斯 (Stokes)：Sir Frederick Wilfred Stokes invented the modern mortar in 1915. His name became synonymous with mortars.

十三劃
後座力式 (Recoil Operated)：An operating mechanism used in autoloading firearms, which use the force of recoil to provide energy to cycle the action. It was first adopted by Maxim in his machine gun.
短後座力作業 (Short Recoil)：Short recoil operation differs from long recoil operation in that the barrel and slide recoil only a short distance before they unlock and separate.

十四劃
銑(Mill)：A machine consists of a milling cutter that rotates about the spindle axis and a worktable that can move in multiple directions relative to the work piece.
樣板 (Template)：A sample pattern used to produce parts correctly.
榮格賜飛機製造廠 (Junker Flugzeug Motorenwerke A.G.)：German aircraft maker, known for its Ju 87 Stuka dive bombers.
輕機槍：An automatic weapon that used rifle cartridges but was suitable for one man operation.

漏夾 (Clip, En Bloc)： A system used to load multiple cartridges simultaneously into a weapon, originally conceived by Mannlicher.

十五劃

歐力根 (Oerlikon)： Swiss ordnance manufacturer lit was a machinery producer but started ordnance manufacturing after acquiring the German firm Contraves in 1923. It's known for its automatic cannons.

衝鋒槍、手提機關槍 (Sub-Machinegun, Maschinenpistole)： A hand held weapon capable of full automatic firing and using pistol cartridges.

德國軍械製造廠 (Deutsches Waffen und Munitionsfabriken, DWM)： German ordnance conglomerate formed by Ludwig Loewe.

十六劃

橋夾 (Charger)： A system invented by Mauser to load multiple cartridges into a weapon.

十九劃

撸子、曲尺： General terms for any auto-loading pistol other than revolvers.

Common Trading Names in China:

三井物產 Mitsui Bussan, Japanese firm, Hankow
泰平組合 Taihei Kumiai, Japanese firm
高田商會 Takada Shokai, Japanese firm
中國電訊報 The China Telegraph
仁記洋行 Gibb, Livingston, American firm
信義洋行 H. Handle & Co., German firm, Beijing
逸信洋行 Bietfelt & Son, German firm, Tienjin、天津
匯豐銀行 Hongkong and Shanghai Banking Corporation
同珍洋行 Bull, Nye & Co., American firm
和記洋行 International Export Co.
地亞士洋行 Diers
大倉洋行 Okura Shoji, Japanese firm, Beijing
天利洋行 Gregory & Company, Hankow
太古洋行 Measrs, Butterfield & Swire/John Swire & Sons Co. Ltd.
寶順洋行 Dent & Co., American firm
怡和洋行 Jardine, Matheson & Co.
慎昌洋行 Anderson-Meyer Trading Company, American firm
捷報 North China Herald, weekly news paper , established on 8/3/1850, 7/1/1864 hanged to 字林西報 North China Daily News
捷成洋行 A. Narte Co., German firm, Beijing
文德洋行 Nielson & Winther, Danish firm
德義洋行 A. Wolte Co., German firm, Tienjin
旗昌洋行 Russell & Co.
旗昌輪胎公司 Shanghai Union Steam Navigation Co.
旗記鐵廠 Thos Hunt & Co., American firm, Shanghai
朴得南公司 Putnam Machine Co., Fitchberg, Massachusetts
泰來洋行 Telge & Co., S, Shanghai
泰利洋行 Brandt & Rodgers, Ltd. British firm, Shanghai
泰和洋行 Reiss Massey & Co. Ltd.
泰平組合公司 Taihei Kumiai, Japanese firm
漢運洋行 Han Yuny Company, Shanghai
瑞生洋行 Buchheister and Company, Tienjin
瑞記洋行 Arnhold, Karberg & Co, German firm, Beijing, Tienjing, Tsindao, Shanghai
瓊記洋行 Augstine Heard & Co., American firm
申報 (Shun Pao) British firm established on 3/23/1872 by 美查洋行 (Major Brothers & Co.)
祥泰洋行 Birley, (Rathbone) Worthington & Co., American firm
禪臣洋行 Siemssen & Co., German firm, Hong Kong, Guangzhou, Shanghai, Tienjin, Hankow
禮和洋行 Carlowitz & Co., German firm, Tienjin, Beijing, Nanking, Hankow, Taiyuan, Tsingtao, Canton, Hongkong, Tsinganfu
美利洋行 Haider & Company, Tienjin
美最時洋行 Melchers GmbH & Co., German firm
輪船招商局 China Merchants' Steam Navigation Company

遠東時報 Far East Review
香港德臣報 China Mail
黑魯洋行/哈魯洋行 S. P. & Hall Co.

Appendix III. Ordnance Office Arsenals As Of April 23, 1941[82]

Arsenal			Marking	Location	Superintendent	Main Products
Current	Alias	Past				
The 1st Arsenal	Hanxin Company	Han Factory		E Gong Yan, Zhang Jia Xi, Chungking	Ding Tianxiong (丁天雄)	cartridges, hand grenades, mines, machine
The 2nd Arsenal	Tienchen Company	Han Powder Factory		Na Xi Gou, Chungking	Xiong Mengxin (熊夢莘)	propellant and black powder
The 3rd Arsenal		Shanghai Steel Mill			Steel	(Merged into Refinery Relocation Committee in Jan, 1943)
The 10th Arsenal	Zhongsu Forest	Artillery Technology Institute		Kong Shui Tuo, Chungking	Zhuang Quan (莊權)	small cannon shells, shell charges
The 11th Arsenal	Gonggu Shop	Gong Factory		Tong Luo Yi, Sichuan	Li Daichen (李待琛)	cannon shells, rifles, machine guns, hand grenades
The 20th Arsenal	Chuanyi Company	The 1st Factory of Sichuan		Tong Yuan Ju, Chungking	Li Weicheng (李維城)	cartridges, mines, brass
The 21st Arsenal	Ninhe Shop	Nin Factory		Bo Ji Shi, Chungking	Li Chenggan (李承干)	rifles, machine guns, mortars, mortar shells
The 21th Arsenal , Kunming Branch				Shi Dian, Kunming	Fan Zhiyuan (范志遠)	mortars, mortar shells
The 22nd Arsenal	Rongguang Company	Optical Factory		Kunming , Yunan,	Zhou Zixin (周自新)	binoculars, range finders
The 23rd Arsenal	Qialu East Villa	Gong Branch		Lu Xian, Sichuan	Wu Qinlie (吳欽烈)	gas masks, chemicals, gun powder

[82]Reference 2, Vol. III, p. 245 and other sources.

The 24th Arsenal	Fengguang Villa	Yu Refinery		Ci Qi Kou, Chungking	Yang Jihui (楊吉輝)	steel, hand grenades
The 25th Arsenal	Nianwu Forest			Zhang Jia Xi, Chunking	Ding Tianxiong (丁天雄)	cartridges, hand grenades, brass
The 26th Arsenal				Zhang Shou, Sichuan	Zhou Zongxiang (周宗祥)	explosives
The 30th Arsenal	Jichuan Company	The 1st Factory of Shaanxi		Wang Jia Tuo, Chungking	Li Shiqiong (李世瓊)	hand grenades, grenade dischargers, grenades
The 31st Arsenal		Northwestern Weapon Repair Depot		Guozhen, Shanxi	Li Xuyi	grenades, bayonets and entrenching tools
The 40th Arsenal	Liuxi Farm	Gui Factory		Qi Jiang, Sichuan	Liu Shouyu (劉守愚)	cartridges, grenade dischargers, grenades
The 41st Arsenal	Tongyeh Company	The 1st Factory of Yue		Tong Zi, Guizhou	Zhong Daochang (鐘道錩)	machine guns, rifles
The 42nd Arsenal	Luxi Forest	Yue Mask Factory		Zun Yi, Guizhou	Chen Zhengxiu (陳正修)	gas masks
The 50th Arsenal	Wushi Forsest	The 2nd Factory of Yue		Guo Jia Tuo, Chungking	Jiang Shao (江杓)	cannon shells, cannon templates
The 51st Arsenal	Wui Forest			Hai Kou Qu, Kunming	Mao Yike (毛毅可)	light machine guns
The 52nd Arsenal Preparatory Office	Wulian Forest			Yi Liang, Yunnan	Wang Rengzhi (王仍之)	cannons, cannon shells
The 53rd Arsenal				Hai Kou Qu, Kunming	Zhou Zixin (周自新)	binoculars, range finders, light machine guns (the merged 22nd and 51st Arsenal)

Refinery Relocation Committee	Luhan Company			Da Du Kou, Chungking	Yang Jiceng (楊繼曾)	steel, tools
Aero Ordnances Research Institute	Wenneng Forest			Wan Xian, Sichuan	Liu Donglai (劉東騋)	grenade launchers, grenades (Became the 27th Arsenal in 1943)
The Southeastern Branch		Zhejiang Iron Works		Dagangtou, Zhejiang	Huang Zhumin (黃祝民)	grenades, rifles and light machine gun (Relocated to Nanpin, Fujian in 1942)

Appendix IV. Ordnance Office List of Ordnance In Service, December, 1933[83]

Pistols in services

Origin	Factory	Pattern	Caliber	Type	Name	Note
China	Hanyang	C96	7.63	Pistol	Han 7.63 C96 pistol	
China	Gongxian	C96	7.63	Pistol	Gong 7.63 C96 pistol	
Foreign		C96	7.63	Pistol	Astra C96 pistol	
Foreign		C96	7.63	Pistol	Astra 20-shot C96 pistol	
Germany		C96	7.63	Pistol	German 20-shot 7.63 C96 pistol	
Germany		C96	7.63	Pistol	German 10-shot 7.63 C96 pistol	
Japan		T26	9	Pistol	Japanese T26 9mm pistol	
Belgium		Browning	9	Pistol	Belgium Browning 9mm pistol	
Belgium		Browning	7.65	Pistol	Belgium Browning 7.65mm pistol	
		C96	9	Pistol	C96 9mm pistol	
		C96	8.8	Pistol	C96 8mm pistol	
Belgium		Royal	8 寸	Pistol	Belgium 8 in Browning pistol	
		地蒙牌	8 寸	Pistol	Belgium 8 in Browning pistol	
			6.35	Pistol	6.35mm 4 in Browning pistol	
			#38	Pistol	#38 revolver	.38 caliber
			#32	Pistol	#32 revolver	.32 caliber

Rifles & Carbines in services

Origin	Factory	Pattern	Caliber	Type	Name	Note
China	Hanyang	88 式	7.9	Rifle	Han 7.9 rifle	Clip
China	Gongxian	Type Year one	7.9	Rifle	Gong 7.9 rifle	Charger
China	Shanghai		6.8	Rifle	Shanghai 6.8 rifle	
China	Guangdong	Type Year one	6.8	Rifle	Yue 6.8 rifle	
China	Guangdong	Type Year one	7.9	Rifle	Yue 7.9 rifle	Charger

[83]Reference 2, Vol. III, p 475

China	Fengtien		7.9	Rifle	Feng 7.9 rifle	Charger
China	Sichuan	Type Year one	7.9	Rifle	Chuan 7.9 rifle	Charger
China	Jiangnan		7.9	Rifle	Jiangnan 7.9 rifle	Clip
China	Taiyuan		7.9	Rifle	Jin 7.9 rifle	
Germany		T88	7.9	Rifle	German T88 7.9 jacketed rifle	
Germany		T98	7.9	Rifle	German T98 7.9 rifle	
Germany		T24	7.9	Rifle	German T24 7.9 rifle	
Germany		Mauser	10	Rifle	German 9-shot 10mm Mauser rifle	
Germany		Mauser	11	Rifle	German 9-shot 格拉司 Mauser 11mm rifle	
Germany		Mauser	11	Rifle	German 9-shot Mauser 11mm rifle	
Germany		Mauser	11	Rifle	German single shot Mauser 11mm rifle	
America		Mauser	11	Rifle	Lee 5-shot 11mm rifle	
America		Mauser	11	Rifle	Lee single shot 11mm rifle	
Britain			11	Rifle	British Martini 11mm rifle	
Britain			11	Rifle	British Peabody 11mm rifle	
Britain			6 分	Rifle	British 太白胎 rifle	19.05mm caliber
Britain			4 分 5	Rifle	British Snider rifle	14.3mm caliber
France				Rifle	French 法得利 rifle	
France				Rifle	French Hotchkiss 11.11mm rifle	
France				Carbine	French 法得利 rifle	
Belgium			7.7	Rifle	Belgium 7.7mm rifle	
America			11	Rifle	US Hotchkiss 11mm rifle	
America			11	Rifle	US Winchester 11mm rifle	
America		Winchester	3 分 5	Rifle	US Winchester 11.11mm rifle	11.11mm
America			7	Rifle	US 7mm rifle	
America			4 分 5	Rifle	US 米斯力 rifle 步槍	14.3mm caliber
Japan		T30	6.5	Rifle	Japanese T30 6.5mm rifle	
Japan		T38	6.5	Rifle	Japanese T38 6.5mm rifle	
Japan		Murata	8	Rifle	Japanese Murata 8mm rifle	
Japan		Murata	8	Carbine	Japanese Murata 8mm carbine	
Japan		T38	6.5	Carbine	Japanese T38 6.5mm carbine	
Japan		T30	6.5	Carbine	Japanese T30 6.5mm	

					carbine	
Belgium		T24	7.9	Rifle	Belgium T24 7.9mm rifle	
Belgium			7.7	Carbine	Belgium 7.7mm carbine	
Austria			6.8	Rifle	Austrian 6.8mm rifle	
Austria		Mannlicher	8	Rifle	Austrian Mannlicher 8mm rifle	
Austria		Mannlicher	8	Carbine	Austrian Mannlicher 8mm carbine	
Austria		Schoenauer (史高達)	7.7	Rifle	Austrian Schoenauer 7.7mm rifle	
Austria		赫德奧	8	Rifle	Austrian 赫德奧 8mm rifle	Rim fire
Britain		Remington	3 分 5	Rifle	British Remington 11.5mm rim fire rifle	11.5mm
Britain			4 分 5	Rifle	British Remington 14.3mm rifle	14.3mm
Russia			7.62	Rifle	Russian 7.62mm rifle	
Russia		Mauser	10	Rifle	Russian single shot 10mm rifle	10mm
Italy			6.6	Rifle	Italian 6.6mm rifle	
Philippines			6.8	Rifle	Philippines 6.8mm rifle	

Machine guns in services

Origin	Factory	Pattern	Caliber	Type	Name	Note
China	Jinglin	Maxim	7.9	Water cooled	Nin Maxim 7.9mm	
China	Jinglin	Auto	8		Nin 8mm automatic rifle	
China	Hanyang	Triple Tens	7.9	Water cooled	Han Triple-Tens 7.9mm	
China	Hanyang		7.63	Submachine gun	Han 7.6 submachine gun	Russian pattern
China	Gongxian	Double Wheeled	7.62	Water cooled	Gong 7.62mm machine gun	
China	Huayang	Triple-Tens	7.9	Water cooled	Huayang Triple-Tens 7.9mm	
China	Taku	Maxim	7.9	Water cooled	Taku Maxim 7.9mm	
China	Taku	Czech	7.9	Light machine gun	Taku Czech 7.9 light machine gun	
China	Sichuan		6.8	Water cooled	Chuan 6.8mm machine gun	
China	Guangdong		8	單機關	Yue 8mm machine gun	Light machine gun
China	Taiyuan	Copy US	11	Submachine gun	Jin 11mm submachine gun	

China	Huayang		7.63	Submachine gun	Huayang 7.63mm submachine gun	
China	Gongxian		7.63	Submachine gun	Gong 7.63mm submachine gun	
China	Shanghai	Triple Tens	7.9	Water cooled	Hu Triple-Tens 7.9mm	
China	Shanghai		7.63	Submachine gun	Hu 7.63mm submachine gun	
China	Fujian	Maxim	7.9	Water cooled	Min Maxim 7.9mm	
China	Hunan	Maxim	7.9	Water cooled	Xiang Maxim 7.9mm	
China	Shandong	Maxim	7.9	Water cooled	Lu Maxim 7.9mm	
France		Hotchkiss	13.2	Anti-aircraft	French 13mm anti-aircraft machine gun	Anti-aircraft or anti-personnel
France		Hotchkiss	7.9	Wheeled machine gun	French Hotchkiss 7.9 light machine gun	
Swiss		Solothurn	7.9	Wheeled machine gun	Swiss Solothurn 7.9mm light machine gun	
Britain		Vickers	7.9	Wheeled machine gun	British Vickers 7.9m light machine gun	
Czech		Czech	7.9	Wheeled machine gun	Czech 7.9mm light machine gun	
Belgium		Browning	7.9	Light machine gun	Belgium Browning 7.9mm light machine gun	
Germany		Maxim	7.9	Water cooled	German Maxim 7.9mm	
Germany		Maxim	7.9	Water cooled	German quadruple mount Maxim 7.9mm	
Germany		Bergmann	7.9	Air cooled	German Bergmann 7.9mm machine gun	
Germany		Maxim	7.9	Light machine gun	German Madsen7.9mm light machine gun	Anti-aircraft mount
Germany		Hotchkiss	8	Light machine gun	German Hotchkiss 8mm light machine gun	
Germany		Kiraly	7.9	Light machine gun	German Kiraly 7.9mm light machine gun	Automatic rifle
Italy			6.6	Light machine gun	Italian 6.6m light machine gun	
Japan		T38	6.5	Light machine gun	Japanese T38 6.5mm light machine gun	
Japan			6.5	Light machine gun	Japanese 6.5mm light machine gun	

Submachine guns in services

Origin	Factory	Pattern	Caliber	Type	Name	Note
China	Huayang		7.63	Submachine gun	Huayang 7.6 submachine gun	
China	Gongxian		7.63	Submachine gun	Gong 7.6 submachine gun	
China	Hanyang		7.63	Submachine gun	Han 7.6 submachine gun	
China	Shanghai		7.63	Submachine gun	Shanghai 7.6 submachine gun	
Germany		C96	7.63	Submachine gun	German Schnellfeuer 7.63 submachine gun	
Germany		Bergmann	7.65	Submachine gun	German Bergmann 7.65 submachine gun	
America			11	Submachine gun	American 11mm submachine gun	

Appendix V. Japanese Military Data

Japanese military created a booklet called "Shinagun Heiki Yoran" (Guide to the weapons of the Chinese army) based on the captured ordnances in China theater in 1938.[1] One of these booklets was obtained by US occupied forces and it's located in Library of Congress today.

Rifles

Model	T38	T30	German M1888	M1888 copies		M1898 Mauser	German M1898	German M1898 copies Type Year One	German M1898 (M1929) rifle-carbine	M1924 short rifle Zhong Zheng Shi
Origin	Japan Hanyang Shenxi	Japan Shenyang Shenxi	Austria Germany	Old pattern China	T23 modified China	Germany Shenyang Shenxi	Germany	Guangdong Guizhou Gongxian	Poland	Germany China
Caliber(mm)	6.5	6.5	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9
Weight(kg)	4.27	3.85	3.72	3.89	4.05	4.082	3.95	4.16	3.854	3.9
O/A Length(m)	1.276	1.275	1.24	1.24	1.237	1.255	1.248	1.245	1.095	1.11
Ammo Capacity	5	5	5	5	5	5	5	5	5	5
Sight	Stand-up	Stand-up	Stand-up	Wave pattern	Wave pattern		Curve pattern	Curve pattern	Curve pattern	Curve pattern

[1] Shinagun Heiki Yoran (Guide to the weapon of the Chinese army), WDC164382, Washington Document Center –WDC, Library of Congress.

Muzzle Velocity(m/s)	762	689	spitzer 878 roun 638			spitzer 878 round 638				
Units Issued	Central army 29th Route army (38 D) (132 D) Shendong Northeastern Guangdong Shenxi Fujian	29th Route army (38 D) (132 D) Northeastern				Central army shenxi, Northeastern Fujian				
Notes										
Author's Notes					Based on Hanyang, no external magazine and use Mauser charger					

Model	M1924	German 1871	German 1871/84	Brno				British rifle	French Steyr	Italian 1891	Russian
Origin	Belgium	Germany	Germany	M 24 Rifle Czech China	M 24 short rifle Czech (Guangdong)	M 88 rifle Czech	M 98 rifle Czech	Britain	France	Italy	Russia
Caliber(mm)	7.9	11	11	6.5	7.9	7.9	7.9	7.7	8	6.5	7.92
Weight(kg)	4.1	4.6	4.6		3.85			3.926	4.172	3.95	4.061
O/A Length(m)	1.095	1.335	1.29	1.23	1.09	1.21	1.23	1.13	1.26	1.275	1.318
Ammo Capacity	5	1	8		5	5	5	10	8	6	5
Sight	Curve pattern	Stand-up	Stand-up	Wave pattern	Curve pattern	Wave pattern	Wave pattern			Wave pattern	
Muzzle Velocity(m/s)								756	650	700	605
Units Issued										Fujian	29th Route army (37D) (143D) Shendong
Notes					(Type 21)						
Author's Notes		Single shot			Should be FN 1930			Rifle .303 in. Ross Mk III (M1910)	M1878 Kropatchek	Carcano	

Model	Russian rifle	Russian M1891	Belgium M1924 Mauser short rifle	Belgium short rifle	Austrian straight-pull rifles		Swiss rifle	Lee M1879	Peabody M1865	German GECO M28	
Origin	Russia	Russia America	Belgium		M1888-1890 Steyr	Qing Jiangnan	***Switzerland***	America	America	Germany	Germany
Caliber(mm)	7.62	7.62	7.9	7.9	8	7.6	11	11	12.5	5.4	5.4
Weight(kg)		4.22	4.1	4.1	3.96	4.24	4.58	3.92	3.87	3	3.46
O/A Length(m)	1.28	1.3	1.095	1.08	1.24	1.28	1.34	1.31	1.31	1.15	1.093
Ammo Capacity	5	1			5		1	5	1	1	1
Sight	Wave pattern	Stand-up	Curve pattern	Curve pattern	W notch	Stand-up	Curve pattern	Step	Stand-up	Curve pattern	Curve pattern
Muzzle Velocity(m/s)											
Units Issued											
Notes		Single shot			M88- black powder M90-smokeless powder	Guang Shi 21st Year, copy of Austrian M88-90					
Author's Notes										22LR Gustav Genschow, Hamburg.	

Carbines

Model	T30	T38	7.92 Hanyang carbine	T23 Carbine(A)	T23 Carbine(B)	German 1888 pattern carbine	Austria M1888-1890 carbine	German M1891 carbine	German M1898 carbine	French Steyr carbine
Origin	Japan	Japan	Hanyang	Hanyang		China	Austria	Austria	Austria	France
Caliber(mm)	6.5	6.5	7.9	7.9		7.9	8	7.9	7.9	8
Weight(kg)	3.29	3.34	3.4				3.8		3.77	
O/A Length(m)	0.965	0.966	0.95	0.97	0.95	0.94	1	0.945	1.095	0.985
Ammo Capacity	5	5	5		5	5	5	5		8
Sight	Stand-up	Stand-up		Wave pattern		Curve pattern	W notch	Stand-up	Curve pattern	W notch
Muzzle Velocity(m/s)	698	708								
Units Issued		Central army	29th Route army (37D) (143D)							
Notes						German M88 had straight sight, range 200-1200mr	Straight-pull	Made in 1893 with barrel jacket	Made in 1917	
Author's Notes										

Submachine Guns & Grenade Dischargers

Model	M1921 Thompson	M1918 Bergmann	Mauser submachine gun	Grenade Discharger	
Origin	America Taku	Germany 大沽 Shenyang Shenxi Beiyang Swiss		Long	Short
Caliber(mm)	11.4	7.63	7.63	5.5	5.5
Weight(kg)	4.7	4.4			
O/A Length(m)	0.824	0.815	0.895	0.6	0.25
Ammo Capacity	20/50	50			
Sight					
Muzzle Velocity(m/s)	260	460			
Units Issued					
Notes	Thompson submachine gun		Made in Henan arsenal in 1926 and imports		
Author's Notes		Also MP 28			

Light Machine Guns

Model	M1919 (M30) Browning light machine gun	T17 light machine gun	Kiraly KE7 light machine gun	Czech ZB-26 light machine gun	M1908/15 Maxim light machine gun	M 1896 Lewis light machine gun	M1909 Hotchkiss light machine gun	M1925 Berthier light machine gun	M1928 Madsen light machine gun	Degtyarev DP1928 light machine gun	M1915 Chauchat (CSRG) light machine gun
Origin	America Belgium	Japan Shenyang	Switzerland	Czech	Germany	America Britain	Britain	Britain	Demark	Russia	China
Caliber(mm)	7.62		7.92	7.92	7.92	7.7	7.7	7.7	7.92	7.62	8
Weight(kg)	8		8	9	16(20)	12	16/8.12	9.2/12	23	10.48	12
O/A Length(m)	1.110/1.130		1.19	1.17	1.3	1.1	1.09/1.18	1.25	0.98	1.16	1.16
Ammo Capacity	20		25	20	Cloth belt (50,100, 250)	50	Strip 30 /Belt 50	30	33	49	28
Sight											
Muzzle Velocity(m/s)	823		750	750	750	735	700	730	810	840	
Units Issued		Central army Northeastern army	Central army	29th Route army Northeastern army	Central army Shenxi	Central army Guangdong Guangxi	Central army 29th Route army				
Notes	US M1919	Same as	High	Good	Chinese	British 303	850				

	Belgium M1930	Japanese T11	reliability, good performance, about 2,500 imported from Switzerland	performance, Chinese name Czech 7.9 light machine gun.	name Maxim light machine gun also M1917/18	caliber	imported in 1937 from France, same as Japanese T38 machine gun				
Author's Notes	BAR		Produced by Huaxin in Chungking			Sichuan		303 caliber			

Heavy Machine Guns

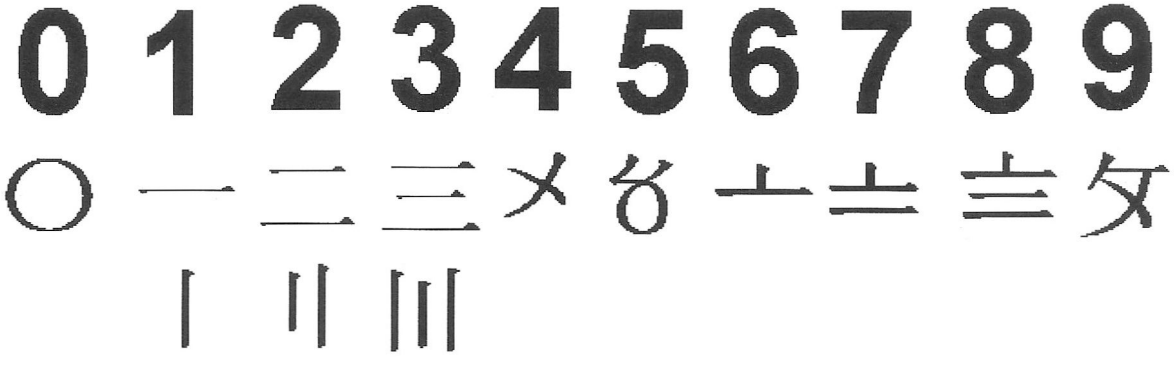
Model	T13 heavy machine gun	T38 heavy machine gun	M1909 Berthier heavy machine gun	Maxim light machine gun	M1908 Maxim heavy machine gun	M 1914 年 Hotchkiss heavy machine gun	M1907 St. Etienne heavy machine gun	M1919 Colt heavy machine gun	M1914 Colt air cool heavy machine gun	Russian Maxim heavy machine gun
Origin	Japan Shenyang	Japan	Britain	Germany	Germany Shenyang Shenxi Jinling	France	France	America	America Russia	Russia
Caliber(mm)			7.7	7.92	7.92	7.92	8	7.62	7.62	7.62
Weight(kg)			17.4/37.6	17.6	52	50	58	40	36	54.5

O/A Length(m)			1.13		1.6	2.25	1.5	1.5	1.57	
Ammo Capacity			Cloth belt 250	Cloth belt (50,100, 250)	Cloth belt 250	Strip 30/251	Strip 25	Cloth belt 250	Cloth belt 200-250	Cloth belt 250
Sight										
Muzzle Velocity(m/s)			740	750	750	700	750	820	820	
Units Issued	Northeastern army Guangxi		Most of Guangdong, some Guangxi	Central army Shenxi security forces	Central army 29th Route army Northeastern army Guangdong Guangxi Shendong Shengxi Yunan	Northeastern army				29th Route army Guangdong Shendong
Notes	Same as Japanese T3			German 08/15				Aka Browning heavy machine gun, same as M1917		
Author's Notes					Should include T24					

Appendix VI. Chinese Ammunition Container Markings[84]

There are some special markings on Chinese cartridge packaging manufactured during and after the war. These markings are a combination of Chinese characters and ancient numeric systems, soit is necessary to have a special knowledge of these areas to identify them. Even an average Chinese reader may not understand these characters.

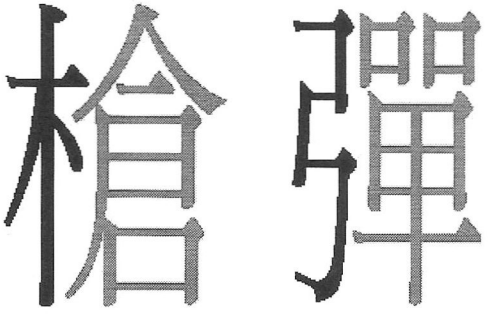
There is an Chinese ancient numeric system worth noting. Tthe graphics below show the comparison of them with the modern system: (Note that the numbers 1, 2, and 3 can be written either vertically or horizontally, especially when they are next to each other to show clarity.)



When the number ten is needed, the modern Chinese numeric system ten - 十 is used directly. For example, 150mm mortar uses 十 and the 5 above.

Examples:
The depiction on the right stands for 79 which represents the caliber of the Mauser 7.9mm cartridges. From the list above, normally it would be presented from left to right like the graphic at the top. Since the military had to do things a little bit differently, they put the 2 numbers on a top-down orientation.

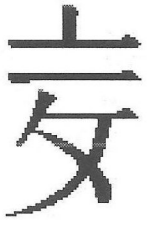
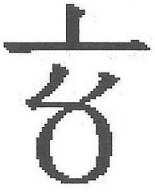
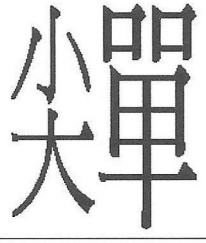
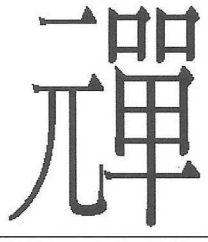
Aside from the ancient numeric system, the military also made up some characters as short hand abbreviations to represent different weapons and cartridges:

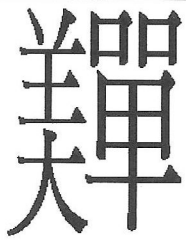
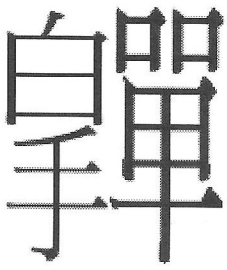


[84] Cartridge Identification, Qian Baoyuan (錢寶元), Ordnance Office, 1947. Courtesy of Fukou. Also, Reference 41

The two characters above represent gun on the right, cartridge on the left. The right portions were taken out to make up new characters to represent different guns and configuration of cartridges.

Common Cartridge Calibers and Types：

Numeric	Note	Combined	Note
	79, 7.9x57mm cartridge		Signal flare
	763, 7.63x25mm cartridge		Pistol cartridge
	65, 6.5x50mmSR cartridge		Cartridge
	Spitzer cartridge		Rifle cartridge
	Round nose cartridge		Pistol cartridge
	Steel core cartridge		Machine gun cartridge

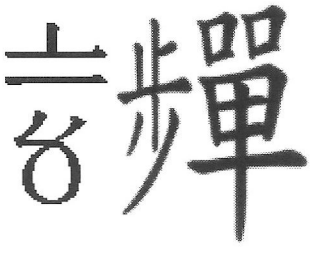
	American cartridge		Mortar shell
	Mountain gun shell		Field gun shell
	High explosive shell		High explosive
	Fragmentation shell		Cluster shell
	Tracer		Shell (brass)
	Impact fuse		Air burst fuse

底	Primer	暴	Detonation transmission tube
26式	Type 26	彈	Cluster shell

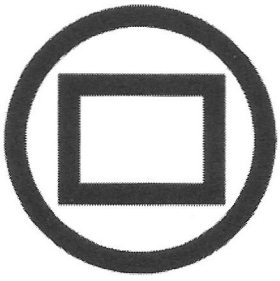
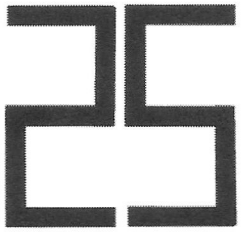
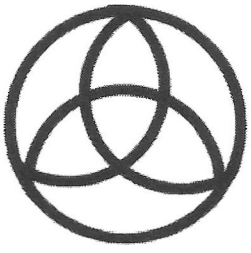
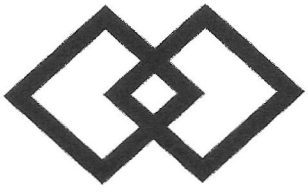
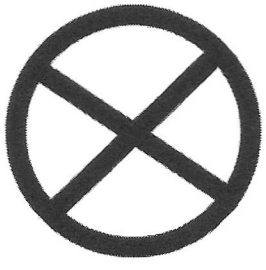
Ammunition Box Markings：

Marking	Note
七(倉步)尖彈	7.9mm rifle spitzer cartridge
七(倉机)尖彈	7.9mm spitzer machine gun cartridge
(七愚)倉彈	7.9mm steel core cartridge
六倉彈	7.63mm pistol cartridge
七(木箭)包彈	7.9mm wood tip practice cartridge

亥(倉步)窀單	7.9mm rifle blank cartridge
(倉手)言單	Pistol signal flare
亥重尖單	7.9mm heavy spitzer cartridge
(26弋)(十名)皇單	Type 26 150mm mortar shell
亓皇單	82mm mortar shell
亥克弋 山包單	Krupp 75mm mountain gun shell
丁名母單	115mm high explosive shell
十三七 蛂 單	Solothurn 37mm anti-tank gun armor piecing shell

	Solothurn 37mm anti-tank gun armor piercing tracer shell
	Vickers M10 152mm high explosive shell
	Bofors 75mm mountain gun high explosive shell
	The 50th Arsenal dual purpose Schneider 75mm gun high explosive shell

Common Ammunition Producers Arsenal Markings：

Marking	Arsenal	Marking	Arsenal
	The 20th Arsenal		The 40th Arsenal (early)
	The 25th Arsenal		The 41st Arsenal
	The 11th Arsenal		The 30th Arsenal
	The 40th Arsenal (late)		The 50th Arsenal